



E-PROJECTS Work Order Number: 1168092

Appropriation: MCON

## **VOLUME 1 OF 3**

**Design-Build RFP for the  
SIMULATOR CENTER and RANGE CONTROL BUILDING  
at**

**Marine Corps Base Camp Lejeune  
North Carolina**

**FY'16 MCON PROJECT P-1346**

PREPARED BY:



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***Final Submission  
20 November 2015***

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Date: November 20, 2015

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## HOW TO USE THIS DOCUMENT

The following is a description of how to utilize this RFP Document including all attachments. This RFP is modeled after the NAVFAC Design/Build Template, developed by the U.S. Navy and refined over the last several years. The primary reasons for modifications to the template are a direct result of the project's multiple structures and complexity.

As noted in the Project Table of Contents, the RFP is broken down into six distinct parts:

- Part One- **Bidding Requirements**
- Part Two- **General Requirements**
- Part Three- **Project Program**
- Part Four- **Performance Technical Specifications**
- Part Five- **Prescriptive Technical Specifications**
- Part Six- **Attachments**

Parts One and Two are self-explanatory, and while custom edited for the project, are fairly typical for all NAVFAC projects. This overview, therefore, will begin in detail at Part Three- **Project Program**.

As noted in the Scope of Work and throughout this RFP, this project will construct a number of individual facilities, improve a significant area of land to locate the new facilities on, and provide all necessary utilities, roadways, etc. to support the new mission. The Part Three Project Program has been developed to tie together all of the requirements for the entire site and every facility - down to each space within every facility.

### Part Three - **Project Program**:

**Sections 1 and 2** (of Part Three) are **narratives** outlining the projects functions and challenges.

**Section 3 Site Analysis**, provides an aerial view, as well as narrative text describing the requirements of the sites development.

**Section 4 Facility Requirements** identifies what is required per facility (and related site). Beginning with the Facility Requirements Sheets, the Project Program provides an Index of every Facility in the project, identifies a letter designation for each facility provided under the RFP, and outlines the facilities' pertinent requirements such as required square footages, Building Code classifications, Sustainable Design Requirements, etc. **Every structure in this project, (whether a building or outdoor apparatus), has at least one sheet in this set of charts.** A general Description of Construction is also included in these sheets identifying what sections of the Engineering System Requirements (ESRs) and Performance Technical Specifications (PTSSs) are relevant to that facility or structure (Section 6 and Part Four, found later in the RFP). **An Index of Facilities prefaces these sheets for reference.**

Immediately following the Facility Requirement Sheets are the Space Tabulation Sheets. These again are organized per facility. These sheets identify **every space required to be included** in the facilities previously identified as part of the project. Every space is allocated a net square footage requirement, minimum ceiling heights, and identifies the proposed occupancy. Where appropriate, additional



information about the space is added under a column called "Remarks". A "Room Type" designation is also identified here for each space. This number corresponds with the next section of Part Three, Section 5.

**Section 5 Room Requirements** cross references the "Room Type" numbers from the Space Tabulation Sheets with an individual room requirement sheet. The Room Requirement Sheets are organized by Functional Groups. Spaces of any given room type may occur in more than one facility. Unless noted on the Space Tabulation sheets, each space sharing a room type designation will have similar requirements. It is on these sheets that specific requirements for every space in the project are identified. Specific items are noted and UNIFORMAT numbers are cross referenced with the ESRs and PTSs in the RFP.

**Section 6 Engineering System Requirements (ESRs)** utilize the WORK BREAKDOWN STRUCTURE (WBS) and UNIFORMAT Numbering System to organize the requirements of each item within the RFP. The ESRs provide more detailed information regarding the project requirements based on building systems.

Part Four - **Performance Technical Specifications (PTSs)** furnishes Technical Specifications, Quality Standards and other performance-based requirements applicable to the project. Like the ESRs, the PTSs utilize the WORK BREAKDOWN STRUCTURE (WBS) and UNIFORMAT Numbering System to organize the requirements of each item within the RFP. The PTSs provide more detailed specifications of building systems.

Part Five - **Prescriptive Technical Specifications** identifies more detailed requirements for systems that will require a strict level of conformance to requirements.

Part Six - **Attachments** are reference documents, drawings, reports, surveys, standards, etcetera, that are requirements of this RFP, and cross referenced with the other five parts. It is the intent of the RFP to identify every item in Part Six as relevant, appropriate, and necessary, to ensure a complete and successful project.

The Project Program and RFP Documents endeavor to be as comprehensive as possible in delineating all project requirements. No document can fully capture all detailed requirements for a project of this magnitude and complexity. The Design-Build Contractor Team is reminded of its obligation under this contract to design and construct "complete and usable" facilities, site work and utilities regardless of the level of information provided in the RFP documents.

-- End of Project Table of Contents -

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## **PART 2 – GENERAL REQUIREMENTS**

### **SIMULATOR CENTER & RANGE CONTROL BUILDING**

**FY'16 MCON PROJECT P-1346**

**MCB Camp Lejeune, North Carolina**

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SECTION 01 14 00.05 20

WORK RESTRICTIONS FOR DESIGN-BUILD  
05/13

PART 1 GENERAL

1.1 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

List of contact personnel; G

1.2 SPECIAL SCHEDULING REQUIREMENTS

- a. The nearby buildings and utilities will remain in operation during the entire construction period. Conduct operations so as to cause the least possible interference with normal operations of the activity.
- b. Permission to interrupt any Activity roads, railroads, and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.
- c. Government Telecommunications Contractor Access: The Government Telecommunications Contractor must be allowed access to the facility towards the end of construction (finishes 90% complete, rough-in 100% complete, Inside Plant (ISP)/Outside Plant (OSP) infrastructure in place) to provide equipment in the telecommunications rooms and make final connections. The Contractor will be required to coordinate their efforts with the Government Telecommunications contractor to facilitate joint use of building spaces during the final phases of construction and work the coordination effort into the construction schedule. Requirements for Government Telecommunications are specified in Part 4, D50 ELECTRICAL and G40 SITE ELECTRICAL UTILITIES.

1.3 CONTRACTOR ACCESS AND USE OF PREMISES

1.3.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.3.1.1 Subcontractors and Personnel Contacts

Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

### 1.3.2 Working Hours

Regular working hours shall consist of an 8 1/2 hour period, Monday through Friday, excluding Government holidays.

### 1.3.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

### 1.3.4 Exclusionary Periods

No work shall be performed during Basewide annual security exercises for 2 days each year , inclusive, without prior written approval of the Contracting Officer. Such delays shall be incorporated into the Contractor's construction schedule and will be at no additional cost or time to the Government.

### 1.3.5 Occupied and Existing Buildings

The Contractor shall be working around existing buildings which are occupied. Do not enter the buildings without prior approval of the Contracting Officer.

### 1.3.6 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."
- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, and compressed air shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."
- d. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

#### 1.3.6.1 Location of Underground Utilities

Obtain digging permits prior to start of excavation. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities, and any type of underground or encased obstruction not indicated or specified to be removed but indicated or discovered during scanning in locations to be traversed by piping, ducts,

and other work to be conducted or installed.

- a. Notification Prior to Excavation: Notify the Contracting Officer at least 15 days prior to starting excavation work.

#### 1.4 SECURITY REQUIREMENTS

Contract Clause "FAR 52.204-2, Security Requirements and Alternate II," "FAC 5252.236-9301, Special Working Conditions and Entry to Work Area," and the following apply:

##### 1.4.1 Business Access Security Requirements, Camp Lejeune, NC

###### 1.4.1.1 Business Access Definition

Contractor/subcontractor employees requiring installation access to MCB, Camp Lejeune or MCAS New River, N.C. must obtain a Business Access Identification Badge for that particular installation. Regularly scheduled delivery personnel, to include FEDEX, UPS, pick-up and deliveries, should also follow the Business Access guidelines described below. Personnel requiring Business Access Identification Badges shall submit all documentation listed below. Badges are not required if the contracted position requires the employee to obtain a Common Access Card (CAC) which will be identified separately within the Government contract.

###### 1.4.1.2 Installation Security Access Requirements

Contractor shall accomplish the security requirements below within 10 days after award or prior to performance under the contract.

###### 1.4.1.3 Business Access Identification Badge Requirement

In order to obtain a Business Access Identification Badge for access to MCB, Camp Lejeune, and satellite activities, or MCAS New River, NC, all personnel providing services under this contract shall be required to present the documentation below to the following offices, as applicable:

- a. MCB, Camp Lejeune, NC and its satellite activities. Report as follows:

1. Identification Card Center, 60 Molly Pitcher Road for badge (910-451-8444).

- b. MCAS New River, NC. Report as follows:

1. S-4 (Facilities Office), Bldg AS-211 (1st Deck) for registration on contractor's list (910-449-6310).
2. Pass and Identification Office, Bldg AS-187 (1st Deck) for badge and vehicle decal (910-449-7695).

###### 1.4.1.4 Documentation

- a. Photo ID:

Valid state or federal issued picture identification card. Acceptable documents include state drivers license, DMV issued photo identification, or alien registration card.

- b. Proof of Employee Citizenship or Legal Alien Status:

Acceptable documents include birth certificate, Social Security Cards, Immigration and Naturalization Service (INS) forms and passports.

c. Proof of Criminal Records Check:

Proof of a criminal records check from the county or state where the employee has resided for the previous two years (or length of legal residence for foreign nationals in the U.S. for less than two years). Criminal background records checks must be from a credible source. Many credible sources exist, but some examples include the County Courthouse, Infolink Screening Services, Inc. ([www.infolinkscreening.com](http://www.infolinkscreening.com)), IntegraScan Criminal Records Checks ([www.integrascan.com](http://www.integrascan.com)), Intelius Employee Screening ([www.Intelius.com](http://www.Intelius.com)), and Castle Branch [www.castlebranch.com](http://www.castlebranch.com)). Subsequent to the initial criminal background records checks, local criminal records checks shall be conducted annually prior to renewal of badges for reevaluation.

d. Letter Provided By Contracting Officer Indicating Contract:

Letter provided by Contracting Officer indicating contract, contract period and prime contractor. Proof of employment on a valid Government contract (e.g., a letter on company letterhead from the prime contractor including contract number and term).

1.4.1.5 Denial of Access

Installation access shall be denied if it is determined that an employee:

- a. Is on the National Terrorist Watch List
- b. Is illegally present in the United States.
- c. Is subject to an outstanding warrant.
- d. Has knowingly submitted an employment questionnaire with false or fraudulent information.
- e. Has been issued a debarment order and is currently banned from military installations.
- f. Is a Registered Sexual Offender, or has any Felony Conviction within the past two years.

1.4.1.6 Appeal Process

All appeals should be directed to the Base Inspector's Office for any individual that has been denied access to the Base.

1.4.1.7 Display and Disposition of Badges

Contractors/subcontractors shall prominently display their badges on their person at all times. Upon completion/termination of this contract or an individual's employment, the Contractor shall collect and turn in to the Pass & ID Office all badges. If the Contractor fails to obtain the employee's badge, the Pass & ID Office shall be notified within 24 hours. During the contract performance period contractors will immediately report instances of lost or stolen badges to the issuing pass and identification office.



#### 1.4.1.8 Contractor and Subcontractor Vehicle Requirements

Each vehicle to be used in contract performance shall show the Contractor's or subcontractor's name so that it is clearly visible and shall always display a valid state license plate and safety inspection sticker. To obtain a vehicle decal, which will be valid for one year or contract period, whichever is shorter, Contractor or subcontractor vehicle operators shall provide to the Vehicle Registration Office, 60 Molly Pitcher Road for vehicle decal (910-451-1158):

- a. An installation sponsor request forwarded to provost Marshall office.
- b. A valid form of Federal or state government I.D.
- c. If driving a motor vehicle, a valid driver's license, vehicle registration and proof of insurance.

Upon completion/termination of this contract or an individual's employment, the Contractor shall collect and turn in to Vehicle Registration all Government vehicle decals. If any are not collected, the Contractor shall notify the Vehicle Registration Office within 24 hours.

#### 1.4.1.9 Security Checks

Contractor personnel and vehicles shall only be present in locations relevant to contract performance. All Contractor personnel entering the base shall conform to all Government regulations and are subject to such checks as may be deemed necessary to ensure that violations do not occur. Employees shall not be permitted on base when such a check reveals that their presence would be detrimental to the security of the base. Subject to security regulations, the Government will allow access to an area for servicing equipment and/or performing required services. Upon request, the Contractor shall submit to the Contracting Officer questionnaires and other forms as may be required for security purposes.

#### PART 2 PRODUCTS

Not used.

#### PART 3 EXECUTION

Not used.

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SECTION 01 20 00.05 20

PRICE AND PAYMENT PROCEDURES FOR DESIGN-BUILD  
05/13

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8 (2014) Construction Equipment Ownership  
and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

EARNED VALUE REPORT; G

1.3 EARNED VALUE REPORT

1.3.1 Data Required

This contract requires the use of a cost-loaded Network Analysis Schedule (NAS). The information required for the Schedule of Prices will be entered as an integral part of the Network Analysis Schedule. Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer an Earned Value Report (construction contract) as directed by the Contracting Officer. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices. Costs shall be summarized and totals provided for each construction category.

1.3.2 Schedule Instructions

Payments will not be made until the Earned Value Report from cost-loaded NAS has been submitted to and accepted by the Contracting Officer. For design phase progress payment(s), the Earned Value Report from the Cost Loaded CPM shall include detailed design activities and general (summarized) approach for the construction phase(s) of the project. The Earned Value Report shall be fully developed with detailed construction line items as design progresses. The complete design and construction Earned Value Report shall be submitted and accepted prior to starting construction work.

For Fast-Tracked or Critical Path Submittals of construction projects, the Earned Value Report shall include detailed design and construction line

items for each fast-tracked/ critical path phase(s), submitted to and accepted by the Contracting Officer during the Post Award Kickoff Meetings and confirmed prior to starting construction work in that phase. Additionally, the Earned Value Report shall be separated as follows:

a. Primary Facility(s) Cost Breakdown:

Defined as work on the primary facility(s) out to the 1.5 m (5 foot) line. Work out to the 1.5 m (5 foot) line shall include construction encompassed within a theoretical line 1.5 m (5 foot) from the face of exterior walls and shall include attendant construction, such as pad mounted HVAC equipment, that may extend beyond the 1.5 m (5 foot) line.

- (1) Provide a cost breakout for all Primary Facility features that support Low Impact Development (LID), such as vegetated roof and rainwater harvesting features. The sum of the Primary Facility Cost above - a. and these Primary Facility LID sub-items - (1) shall equal the total Primary Facility cost. Provide a subtotal cost of all Primary Facility LID sub-items on the Earned Value Report at design complete and project closeout.

b. Supporting Facilities Cost Breakdown:

Defined as site work, including incidental work, outside the 1.5 m (5 foot) line.

- (1) Provide a cost breakout for all Supporting Facilities features that support LID, such as bioswales, permeable paving, infiltration basins, tree box filters, etc. The sum of the Supporting Facilities Cost above - b. and these Supporting Facilities LID sub-items - (1) shall equal the total Supporting Facilities cost. Provide a subtotal cost of all Supporting Facilities LID sub-items on the Earned Value Report at design complete and project closeout.

### 1.3.3 Real Property Assets

Real Property Assets identified in Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES paragraph "REAL PROPERTY RECORD" apply to work covered by this specification.

Cost and facility data accumulated under this section are required in the preparation of DD Form 1354. Coordinate with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES paragraph "REAL PROPERTY RECORD".

**NOTE:** Real Property Unique Identifiers (RPUID's) will be provided by the Government but may not be available until later in the project schedule. Coordinate receipt of the RPUID's with the Contracting Officer and the Real Property Accounting Officer. Temporary RPUID's may be required until the actual RPUID's can be provided.

Accumulate data using the appropriate division of the RPUID's/ Category Codes to represent the final constructed facility real property assets that apply to this contract. Include physical data and all associated costs required for completion of DD Form 1354. The Contractor shall meet with the Contracting Officer and the Real Property Accounting Officer during the Post Award Kickoff Meeting and the Project Closeout Meetings to modify and include any necessary changes to the DD Form 1354. Coordinate the Contractor's Price and Payment structure with the structure of the RPUIDs/

Category Codes. Asset breakdowns and construction categories may be modified by the Contracting Officer as necessary during course of work.

#### 1.3.4 Schedule Requirements for HVAC TAB

The field work required by PTS Section D30, HVAC, and Design-Build Contractor prepared Section 23 05 93 TESTING, ADJUSTING AND BALANCING shall be broken down in the Earned Value Report from the cost-loaded NAS by separate line items which reflect measurable deliverables. Specific payment percentages for each line item shall be determined on a case by case basis for each contract. The line items shall be as follow:

- a. Approval of Design Review Report: The TABS Agency is required to conduct a review of the project plans and specifications to identify any feature, or the lack thereof, that would preclude successful testing and balancing of the project HVAC systems. The resulting findings shall be submitted to the Government to allow correction of the design. The progress payment shall be issued after review and approval of the report.
- b. Approval of the pre-field engineering report: The TABS Agency submits a report which outlines the scope of field work. The report shall contain details of what systems will be tested, procedures to be used, sample report forms for reporting test results and a quality control checklist of work items that must be completed before TABS field work commences.
- c. Season I field work: Incremental payments are issued as the TABS field work progresses. The TABS Agency mobilizes to the project site and executes the field work as outlined in the pre-field engineering report. The HVAC water and air systems are balanced and operational data shall be collected for one seasonal condition (either summer or winter depending on project timing).
- d. Approval of Season I report: On completion of the Season I field work, the data is compiled into a report and submitted to the Government. The report is reviewed, and approved, after ensuring compliance with the pre-field engineering report scope of work.
- e. Completion of Season I field QA check: Contract QC and Government representatives meet the TABS Agency at the jobsite to retest portions of the systems reported in the Season I report. The purpose of these tests are to validate the accuracy and completeness of the previously submitted Season I report.
- f. Approval of Season II report: The TABS Agency completes all Season II field work, which is normally comprised mainly of taking heat transfer temperature readings, in the season opposite of that under which Season I performance data was compiled. This data shall be compiled into a report and submitted to the Government. On completion of submittal review to ensure compliance with the pre-field engineering report scope, progress payment is issued. Progress payment is less than that issued for the Season I report since most of the water and air balancing work effort is completed under Season I.

#### 1.3.5 Schedule Requirements for Third Party Certification for Sustainability

Submittals to the U.S. Department of Energy's Federal Energy Management Program, High Performance Federal Buildings Database for Third Party

Certification for sustainability as required in Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES shall be included as activities in the NAS. A separate line item equal to 0.5 percent of the contract/task order value and identified as - Third Party Certification for sustainability, shall be included in the contractor's Earned Value Report from the cost-loaded NAS. The unit of measure for this line item shall be lump sum without any payment made until the specified level of Third Party certification is obtained and the Third Party Certification documentation is provided to the Contracting Officer in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

#### 1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

#### 1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

##### 1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause "FAR 52.232-27, Prompt Payment Construction Contracts," and shall include items required by FAR 52.232-5, "Payments under Fixed-Price Construction Contracts". The Requests for payment shall include the documents listed below.

- a. The Contractor's invoice on Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract. Provide the number of copies required by the Contracting Officer.
- b. The Earned Value Report from the cost-loaded NAS, showing in detail: the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract. Submit number of copies required by the Contracting Officer.
- c. Updated schedule and reports required by the contract if not already submitted per Section 01 32 17.05 20 NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD.
- d. Contractor Safety Self Evaluation Checklist.
- e. Other supporting documents as requested.
- f. Updated copy of submittal register.
- g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.
- h. Subcontractor and supplier payment certification.
- i. Materials on Site.
- j. Affidavit to accompany invoice (LANTDIV NORVA Form 4-4235/4 (Rev.5/81)).

#### 1.5.2 Submission of Invoices

If NFAS Clause 5252.232-9301 is included in the contract, the documents listed in paragraph titled "Content of Invoice" above shall be provided in their entirety as an attachment in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer. All other paper invoices shall be forwarded with specific marking on the envelope. This marking shall be in the front lower left hand corner, in large letters, "INVOICES - ENCLOSED."

Monthly invoices and supporting forms for work performed through the anniversary award date of the contract shall be submitted to the Contracting Officer within 5 calendar days of the date of invoice. For example, contract award date is the 7th of the month, the date of each monthly invoice shall be the 7th and the invoice shall be submitted by the 12th of the month.

#### 1.5.3 Final Invoice

- a. Final invoice shall be accompanied by Final Release Form, NAVFAC Form 4330/07, furnished by the Government. If the contractor is incorporated, the release shall contain the corporate seal. An officer of the corporation shall sign the release and the corporate secretary shall certify the release.
- b. For final invoices being submitted via WAWF, the original Contractor's Final Release form must be provided to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original final release form has been confirmed by the Contracting Officer, Contractor shall then submit final invoice and attach copy of the final release form in WAWF.
- c. Final invoices not accompanied by Final Release Form will be considered incomplete and will be returned to the Contractor.

#### 1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

##### 1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

- a. Reasonable deductions due to defects in material or workmanship;
- b. Claims which the Government may have against the Contractor under or in connection with this contract;
- c. Unless otherwise adjusted, repayment to the Government upon demand for

overpayments made to the Contractor; and

- d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

#### 1.6.2 Payment for Onsite and Offsite Materials

Progress payments may be made to the contractor for materials delivered on the site, for materials stored off construction sites, or materials that are in transit to the construction sites under the following conditions:

- a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.
- b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings, precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs) and high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.
- c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with **Earned Value Report** requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.
- d. Materials are adequately insured and protected from theft and exposure.
- e. Provide a written consent from the surety company with each payment request for offsite materials.
- f. Materials to be considered for progress payments prior to installation shall be stored **in the Continental United States**.

#### PART 2 PRODUCTS

Not used.

#### PART 3 EXECUTION

Not used.

-- End of Section --



SECTION 01 30 00.05 20

ADMINISTRATIVE REQUIREMENTS FOR DESIGN-BUILD

05/13

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

1.2 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit a view location sketch indicating points of view. Submit with the monthly invoice two sets of digital photographs each set on a separate CD-R, cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch shall also be provided on the CD as digital file. All file names shall include a date designator. Cross reference submittals in the appropriate daily report. Photographs shall be provided for unrestricted use by the Government.

1.3 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

- a. Comprehensive general liability: \$500,000 per occurrence
- b. Automobile liability: \$200,000 per person, \$500,000 per occurrence for bodily injury, \$20,000 per occurrence for property damage
- c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.
- d. Employer's liability coverage of \$100,000, except in States where workers compensation may not be written by private carriers,
- e. Others as required by the State.

#### 1.4 CONTRACTOR PERSONNEL REQUIREMENTS

##### 1.4.1 Subcontractor Special Requirements

###### 1.4.1.1 Asbestos Containing Material

All contract requirements of PART 4, F20 SELECTIVE DEMOLITION, assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

###### 1.4.1.2 HVAC TAB

All contract requirements of TAB work required by PART 4, D30, HVAC, shall be accomplished directly by a first tier subcontractor. No TAB work required by PART 4, D30, HVAC, shall be accomplished by a second tier subcontractor.

###### 1.4.1.3 Qualified Testing Organization

All contract requirements of work required to be performed by a Qualified Testing Organization in PART 4, D50 ELECTRICAL and G40 SITE ELECTRICAL UTILITIES, shall be accomplished directly by a first tier subcontractor. No work to be performed by a Qualified Testing Organization, required by PART 4, D50 and G40 shall be accomplished by a second tier subcontractor.

#### 1.5 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, the Quality Control (QC) representative shall also have fluent English communication skills.

#### 1.6 AVAILABILITY OF CADD DRAWING FILES

After award and upon request, the electronic "Computer-Aided Drafting and Design (CADD)" drawing files will be made available to the Contractor for use in preparation of construction drawings and data related to the referenced contract subject to the following terms and conditions.

Native CADD files will **not** be made available to bidders prior to award. Files shall be turned over to the Contractor post-award in the following formats:

- a. Site Physical/Topographic Survey Drawings: These are available in AutoCAD 2010 (.dwg) format
- b. RFP Proposed Site Layout Drawings: These are available in Revit 2013 (.rvt) format, but can be made available in AutoCAD format upon request.
- c. RFP Proposed Facility Layout Drawings: These are available in Revit 2013 (.rvt) format, but can be made available in AutoCAD format upon request.

Data contained on these electronic files shall not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in

connection with the use of these electronic files. The Contractor shall, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CADD drawing files are not construction documents. Differences may exist between the CADD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CADD files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished CADD files, the signed and sealed construction documents shall govern. The Contractor is responsible for determining if any conflict exists. Use of these CADD files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates and/or modifies these electronic CADD files for use in producing construction drawings and data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) shall be removed.

#### 1.7 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

#### PART 2 PRODUCTS

Not used.

#### PART 3 EXECUTION

Not used.

-- End of Section --

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SECTION 01 30 01.00 22

DESIGN, PROCUREMENT, AND INSTALLATION OF FURNITURE, FIXTURES, AND EQUIPMENT  
11/12

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Preliminary (Pre-Final) FF&E Package

Final FF&E Package ; G

Best Value Determinations ; G

Audio Visual (A/V) Package ; G

SD-11 Closeout Submittals

Interior Photography

1.2 GENERAL REQUIREMENTS

Furnishings, Fixtures, and Equipment (FF&E) shall include, but is not limited to; furniture, shop equipment, specialty equipment, audio visual (A/V), appliances, window treatments, artwork, accessories, and other miscellaneous items to support facility functions. Weapon racks, drying cages, and lockers are not considered FF&E. FF&E and A/V shall be fully integrated with the building systems and finishes. FF&E may also include specialty items for which the customer activity shall be responsible for specifying.

The design and documentation of the FF&E and A/V shall be funded and performed as Interior Design Services integral to all Base Bid design of the facilities. The purchase and installation of the FF&E Package and A/V Package shall be funded separately as the FF&E Planned Modifications. The Government FF&E and A/V budgets are stated on on the Bid Schedule/Price Proposal Form for the FF&E and A/V Planned Modification and do NOT include the Contractor's Handling and Administration Rate (HAR). This Government FF&E estimate shall not be altered by Contractors during the bid process.

All FF&E items are subject to the Buy American Act.

1.3 COMPREHENSIVE INTERIOR DESIGN SERVICES FOR FF&E AND A/V

1.3.1 Affiliations

The Prime Contractor's Interior Designer, Design Firm owners, and any Specialists shall NOT have any affiliation with the products specified, any furniture dealership of manufacturer. The NAVFAC Interior Designer reserves the right to approve/disapprove the Contractor's Interior Designer.

### 1.3.2 Concept FF&E Package

Salient characteristics of all required FF&E and A/V items are described under the Room Requirements of this RFP. The Prime Contractor shall provide the services of an interior designer who is certified by the National Council for Interior Design Qualification (NCIDQ) to function as the Interior Designer of Record, hereafter referred to as the Prime Contractor's Interior Designer, to prepare and provide the Final, Best Valued FF&E Package and procurement data based on the Concept FF&E package. The Interior Designer of Record may be an employee of the Contractor's prime A&E subcontractor.

All fixed and movable furnishings selections shall be closely coordinated with the final construction documents and interior finishes. The Prime Contractor's Interior Designer shall be required to validate all FF&E and A/V requirements with the Activity, make any necessary changes to the FF&E and interior building finishes, coordinate with the Prime Contractor to ensure that all outlets, switches, fire extinguishers, thermostates, etc. shall be fully accessible. All sprinkler heads, ADA, etc. clearances shall be accommodated. The Prime Contractor's Interior Designer shall also attend walk-throughs, coordinate mock-ups, and attend any and all required meetings to accomplish this task.

The Contractor's Interior Designer and equipment specialists shall be responsible for designing and providing specifications for procurement of all FF&E, to include delivery and installation, for the facilities built under this contract as directed by the NAVFAC Interior Designer. FF&E specifications shall be based on NAVSUP Blanket Purchase Agreements (BPA's), GSA schedules, and other Federal contracts and complying with priorities found in FAR Part 8.404. The utilization of the current NAVSUP BPA list is required for BVD Analysis Request for Pricing. The current NAVSUP BPA list is available at:

[https://acquisition.navy.mil/rda/home/acquisition\\_one\\_source/strategic\\_sourcing/don\\_furniture\\_acquisition](https://acquisition.navy.mil/rda/home/acquisition_one_source/strategic_sourcing/don_furniture_acquisition)

### 1.3.3 Audio Visual (A/V) Package and/or other Specialty Furniture or Equipment

When A/V, or other specialty furniture or equipment, i.e. shop equipment, kitchen equipment, fitness equipment, high density storage, etc., is required in the project, the Contractor shall obtain the services of equipment specialists to provide design and specifications for the specialty equipment and provide separate Best Value Determinations (BVDs) for this equipment, if required by NAVFAC. This Final package shall be in accordance with the general interior design requirements in UFC 3-120-10 and as required for all areas as developed during the client FF&E and A/V programming and validation process.

The A/V package must be prepared as a separate package from the FF&E package.

Design, procurement, and installation of the A/V package shall comply with all of the same requirements as those defined for the FF&E package in this specification section. Additionally provide A/V floor plans indicating equipment locations and A/V riser diagrams for all A/V systems and coordinate equipment locations and power requirements with power plans.

Provide riser diagrams for audio signal and video signal from source devices to all output devices. Located all source and output devices on plans. The Final FF&E and A/V packages shall be fully integrated into the

design, construction, and construction schedule for the building.

#### 1.4 FURNISHINGS, FIXTURES, AND EQUIPMENT (FF&E) SUBMITTALS

Develop design as described and in accordance with the Activity requirements. Include in the design all loose furnishings required to produce an optimum functional facility, consistent with quality commercial design. This project also includes the preparation of specific detailed information for each selected item. Each submittal shall demonstrate thorough interaction with the Activity requirements and complete coordination with the facility design and the Structural Interior Design (SID).

- a. For all projects, including fast track projects, the Prime Contractor shall be responsible for sufficiently scheduling all FF&E and A/V and any revisions to SID submittals early enough to obtain the required government approvals, and meet all ordering and installation lead times to complete the project by the contract completion date.

These are minimum requirements and the Prime Contractor shall be prepared to provide any/all additional meetings and submittals that may be necessary to support the Interior Design effort/ and FF&E coordination.

##### 1.4.1 FF&E Requirements (Interior Design Orientation) Meeting

This meeting shall occur at the **Post-Award Kickoff (PAK)** meeting prior to the **Contractor Design Workshop** and FF&E "Over the Shoulder" Review and the development of the FF&E package. The NAVFAC Interior Designer will provide the Contractor's Interior Designer a sample format of the FF&E submittal, review the Best Value Determination (BVD) process, discuss the number of Best Value Determinations required and discuss Blanket Purchase Agreement (BPAs), GSA or other mandatory sources to consider. Minutes of this meeting shall be submitted to the NAVFAC Interior Designer within 7 business days.

##### 1.4.2 FF&E and A/V Expectations at the Contractor Design Workshop (CDW)

In conjunction with the Contractor Design Workshop, the Contractor's Interior Designer will present the Building floor plans with all major FF&E items, such as furniture, workstations, seating, movable shelving, file cabinets and safes, copiers and printers located and identified. Locate and identify all major A/V components, such as projection systems, wall- or overhead-mounted TVs and monitors, projection surfaces and rack-mounted A/V gear. Identify any spaces that are to receive videoteleconferencing (VTC) capabilities, and locate major components, including cameras, speakers and microphones on the plans in such spaces, coordinated with other furnishings such as tables and chairs. Identify any spaces where A/V requirements trigger need for dimmable lighting or acoustical treatments. Coordinate all FF&E and A/V items described within the Room Requirements with room proportions and layout of spaces, doors and windows, and other building elements and systems.

##### 1.4.3 FF&E "Over the Shoulder" Review

Prior to the Preliminary FF&E Submittal the Contractor's Interior Designer shall meet with the NAVFAC Interior Designer for an "over-the-shoulder" review to present preliminary FF&E and A/V selections. These can be presented in a "loose" format for preliminary approval prior to the Activity presentation. The "over-the-shoulder" review meeting shall be

held at a convenient location to be determined .

#### 1.4.4 FF&E Concept Presentation

The Prime Contractor's Interior Designer shall present the NAVFAC approved Preliminary (Pre-final) FF&E package to the Activity for approval. This presentation shall include loose format samples and catalog cuts. Sample boards are not required.

#### 1.4.5 Best Value Determination(BVD) Analysis "Over the Shoulder Review"

Prior to issuing the Best Value Determination (BVD) Analysis, the Prime Contractor's Interior Designer shall meet with the NAVFAC Interior Designer for an "over-the-shoulder" review of the solicitation package. The "over-the-shoulder" review meeting shall be held at a convenient location to be determined or via conference call. The Contractor's Interior Designer must provide a copy of the BVD Analysis Request for Pricing cover letter to the Contractor for review and comment in advance of the BVD Analysis "Over the Shoulder Review" meeting.

BVD Analysis Solicitation shall include the following;

- a. Copy of the BVD Analysis Request for Pricing cover letter
- b. BVD Analysis Request for Pricing Spreadsheet/Questionnaire with "basis of design" item product numbers, photos & descriptions
- c. Technical Specification to establish minimum acceptable FF&E requirements
- d. Project Specific Room/Furniture Typical
- e. Furniture Plans with Legends coded to the BVD Analysis RFP (PDF format)

#### 1.4.6 BVD Submittal and "Over the Shoulder Review"

The Prime Contractor's Interior Designer shall submit one (1) copy of the Preliminary BVA BVD package to the NAVFAC Interior Designer and one (1) copy to IDD/Base Property for Marine Corps projects. An electronic copy shall be sent to the NAVFAC Contracting Officer. The "over-the-shoulder" review meeting shall be held at a convenient location to be determined or via conference call to review the results of the solicitation and determine a best value recommendation. The BVD Submittal shall be in a 3-ring binder and shall include the following items for review and approval:

- a. Cover Title Page (project name, project #, location, submittal date, submittal title)
- b. Table of Contents
- c. Point of Contact List
- d. Narrative of Interior Designer Objectives
- e. BVD Analysis Request for Pricing Spreadsheet/Questionnaire completed by all bidders and completed Questionnaire
- f. Copy of all information sent to bidders and documentation that all required sources were contacted



- g. Back-up Information submitted by each bidder (cut sheets/highlighted pricing sheets/technical specifications, pricing, dealer and manufacturer qualification for each product showing that products meets all requirements.) Provide in CD format and include within each binder.
- h. Response(s) from UNICOR.
- i. BVD Analysis Pricing Evaluation Spreadsheet comparing bidder quotes/responses.
- j. Contractor's Interior Designer recommendation for the Best Value vendor and justifications.

#### 1.4.7 Preliminary FF&E Submittal

The Preliminary FF&E submittal shall be presented to the Activity and NAVFAC. Five (5) submittals will be required; (1) for the NAVFAC Project Manager, (1) for the FEAD/ROICC, (1) for IDD, (1) for Base Property, and (1) for the Activity.

Submit the following in a 3-ring binder (with the exception of the 16x20 color boards for the Activity only) for review and approval:

- a. Cover Title Page (project name and number, submittal date and title)
- b. Table of Contents
- c. Point of Contact List (includes contact info for recommended Best Value BPA Holder(s) vendors and subcontractors)
- d. Preliminary FF&E list (Cost Summary) to include shipping, freight, handling, professional installation, project management, HAR and applicable sales tax
- e. Preliminary Procurement Data Spec Sheets for each product indicating general appearance as well as proposed finish and fabric selections
- f. Furniture placement plans coded to the FF&E list and Procurement Data Spec Sheets
- g. Technical Specifications used in bid request for all furniture, fixtures and equipment etc.
- h. 16x20 inch color boards of furniture and finishes specified for Activity presentation to indicate overall design intent (1 copy required for Activity only)
- i. Final Finish/Fabric Selections and Samples attached to boards in 8" x 10" binder format inusing edge-reinforced, heavy-duty plastic sheet protectors for each board/sheet.

#### 1.4.8 Final FF&E Submittal

The Final FF&E submittal shall be due 10 months prior to BOD following the receipt of review comments on the preliminary FF&E submittal and shall include furniture, furnishings, artwork, and equipment and shall be in the format described below or the format provided by the NAVFAC Interior Designer and the UFC 3-120-10 Interior Design.

These are minimum requirements and the Contractor shall be prepared to provide any additional meetings and submittals that may be necessary to support the Interior Design effort and FF&E coordination.

The **Final FF&E Package** Submittal shall be submitted in a 3-ring binder for review and approval. The number of final submittals required shall be;

Five (5) total; One each for the NAVFAC Project Manager and the Activity. Three to be shared between the FEAD/ROICC and IDD **and** Base Property.

The Final FF&E Submittal and **BVD Cost Summary** shall include the following;

- a. Cover Title Page with project name, project #, submittal date, submittal title identified on binder cover and spine.
- b. Table of Contents
- c. Point of Contact List which includes contact info for recommended Best Value BPA Holder(s) vendors and subcontractors.
- d. Final FF&E list (Cost Summary) to include shipping, handling, freight, professional installation, project management, HAR and any applicable sales tax.
- e. Final Procurement Data Spec Sheets for each product indicating final finish and fabric selections
- f. Final Finish Selections and Memo Samples for the FF&E submitted in 8 x 10 binder format, using heavy-duty plastic sheet protectors.
- g. Copy of Final Quote(s)/Response(s) on letterhead from the vendor(s) determined to be the Best Value.
- h. Best Value Determination Guidelines sheets; completed and signed by the Contactor's Interior Designer.
- i. Final Furniture Placement Plans coded to the FF&E list, Procurement Data Sheets and specifications
- j. CD copy of the final FF&E binder.

1.4.9 Punch List: See section 2.1.13 Punch List.

1.4.10 FF&E and Interior Finish Construction Submittals

Submit any revisions or deviations caused by discontinued items or NAVFAC required changes to the Contracting Officer for approval by the NAVFAC Interior Designer. All submittal due dates for the FF&E, A/V and specialty equipment shall be reflected in the Contractor's construction schedule. Changes to the FF&E schedule shall be submitted to the government Interior Designer for approval. The Final FF&E package shall be submitted no later than 9 months prior to the contract completion date.

## 1.5 BEST VALUE DETERMINATION

A Best Value Determination (BVD) is required by FAR 8.404 when placing orders against Federal Supply Schedules for the selection of furniture and

furnishings. Best Value is defined in FAR 2.101 as ensuring that the order to be placed under a Federal Supply Schedule results in the lowest overall cost alternative (considering price, special features, administrative costs and client's needs) to meet the government's needs.

- a. A (BVD) shall be performed on a minimum of three manufacturers for orders exceeding a total procurement of \$3000 from an individual manufacturer. Multiple BVDs may be required in order to complete the final FF&E package.
- b. The required quantity of BVD's to be performed will be determined by the NAVFAC Interior Designer during the design phase and is dependent on the appropriate NAVSUP BPA category(s) to be utilized.
- c. Documentation shall be provided to the Government with the final FF&E package. Specific Documentation is indicated in 1.3.5 Preliminary BVA Submittal and "Over the Shoulder Review." The BVD Statement shall be completed and signed by the contractor's interior designer.

The Prime Contractor's Interior Designer is responsible for the following written BVD justifications:

1.5.1 Total procurement greater than \$150,000

from all BPA holders under the applicable group for FF&E procurements greater than \$150,000. UNICOR must always be solicited. The Prime Contractor's Interior Designer shall develop performance criteria and project requirements based on a generic design for the BPA holders and UNICOR to develop a price and performance proposal. The BVD form must be completed and submitted for all FF&E procurements greater than \$100,000 and manufacturer's quotes and a summary of all proposals must be attached.

1.5.2 UNICOR

Federal Prison Industries (UNICOR) must be considered as part of all BVDs. This must be done by sending an email with the requirements and evaluation criteria. If they are not comparable in one or more areas of price, quality, and time of delivery, the designer can specify product under NAVSUP BPA or GSA schedule.

1.5.3 Evaluation Factors

The Best Value determination Determination shall address issues such as;

- a. Space planning; human factors data related to anthropometrics (reach, clearance, adjustability), space, and acoustics.
- b. Ergonomics
- c. Product quality (including construction and materials); sustainability features, product warranties; history of the product and/or manufacturer
- d. Ability to service products through dealers or others within a certain geographical range of the project.
- e. Price (including freight)
- f. Aesthetics

- g. Appropriateness; and lighting, power and telecommunications systems management and/or coordination as related to the facility (when applicable); and other project specific factors as identified and/or required.
- h. Emphasis shall be to create a fully integrated design solution by providing quality products to meet the functional needs of the customer. Customer preferences shall be considered. The focus shall be on the best overall value. Use the NAVFAC Best Value Determination forms provided by the NAVFAC Interior Designer.

## PART 2 FF&E TURNKEY EFFORT

### 2.1 FF&E PLANNED MODIFICATION

FF&E Planned Modification: As a planned modification, provide procurement and installation coordination of the complete and usable Final FF&E package. The FF&E Package must include shipping, freight, handling, installation and the Prime Contractor's FF&E Handling and Administration Rate (HAR) percentage as applied to the final FF&E total cost.

- a. The Audio Visual (AV) Equipment will be identified as a separate line item, priced separately from the FF&E and funded as an option.

#### 2.1.1 Authorization

The Government will provide separate funding for procurement and installation coordination of the FF&E package and A/V packages. Construction funds will not be used. Upon receipt of required funding, the Prime Contractor shall be authorized by the Contracting Officer, as a planned modification to the construction contract, to procure and install all Final FF&E utilizing NAVSUP Blanket Purchase Agreements (BPA's), GSA schedules, and other Federal contracts and complying with priorities found in FAR Part 8.404. The Prime Contractor will be expected to procure and coordinate the installation of the approved Final FF&E package exactly as specified, or **Government**-approved equal. The amount of the modification will be the actual cost of these items from the Federal Government price schedules (NAVSUP BPAs and/or GSA), including any freight and installation charges from the furniture supplier as well as the Prime Contractor's HAR and any applicable state sales tax. The HAR includes all of the Prime Contractor's effort related to storage, coordination, handling, administration of subcontractors, and all other associated costs and profit for the procurement of FF&E.

The Government will indicate the FF&E and A/V estimates based on the Concept Design in the contract solicitation Price Proposal Form (Bid Schedule). These Government estimates shall not be altered by Prime Contractors during the bid process.

Prime Contractors shall propose a Handling and Administration Rate (HAR) only. The Prime Contractor will propose the FF&E HAR in the contract solicitation. The Prime Contractor's proposed HAR may not exceed 5% of the total FF&E costs, as noted on the bid schedule. The HAR shall not include costs associated with the Interior Design Services required in the Interior Design Services Option.

FF&E items are subject to the Buy American Act.

#### 2.1.2 Procurement and Installation

The Prime Contractor shall coordinate the building completion date with the installation dealer(s) specified in the FF&E Package.

The Prime Contractor shall anticipate possible manufacturer price increases if order placement is delayed. It is recommended to order the FF&E product once the planned modification is awarded and funds are received to avoid incurring additional costs. Delayed production and delivery dates can be noted at the time of order placement to coincide with the contract completion date. Any costs incurred due to manufacturer price increases will be the burden of the Prime Contractor.

#### 2.1.3 Use of Blanket Purchase Agreements (BPA) and GSA Schedules

The Prime Contractor will receive a letter of authorization from the Contracting Officer citing the name of the furniture dealer(s) and other information to use when accessing the Federal Government supply sources.

#### 2.1.4 Deposits

The Prime Contractor should anticipate providing a deposit of between 30% and 50% of the FF&E costs when placing the orders with the manufacturer's dealerships.

#### 2.1.5 Davis Bacon Wages

Davis Bacon wages do not apply to the FF&E installer from the Government supply sources. The workforce for the FF&E installation and delivery shall be separate and distinct from the labor workforce performing under the construction contract.

#### 2.1.6 Sales Tax

The Prime Contractor shall take maximum advantage of all exemptions from State and Local taxation authorities whether available to it directly or available to the Prime Contractor based on an exemption afforded the Government. The responsibility for paying applicable taxes rests with the Prime Contractor. Any state and local taxes applicable to the FF&E shall be included within the FF&E Dealer's quote. Any items purchased as building materials such as carpet are taxable.

#### 2.1.7 Bonds

FF&E items are not considered construction and the prime contractor shall not be required to secure any additional bond for the award of the FF&E line item unless otherwise indicated in the contract. If any additional bond is required for the FF&E line item it is to be included in the prime contractor's FF&E HAR.

#### 2.1.8 Unique Item Identification (IUID) and Valuation

Unique item identification and valuation is a system of marking and valuing items delivered to DoD that enhances logistics, contracting, and financial business transactions. The IUID policy is mandatory for all DoD contracts that require the delivery of items. An item is a single article or a single unit formed by a grouping of subassemblies, components or constituent parts. The Prime Contractor shall provide DoD Unique item identification, valuation and delivery of data for all required FF&E items for which the government's unit acquisition cost is \$5,000 or more.

## PART 3 EXECUTION

### 3.1 Installation

The FF&E package includes the installation of all furniture and furnishings as specified in the FF&E package. The installation dealer(s) specified in the FF&E package shall receive, store as required, transport to the project site, off load, inside deliver, unpack, assemble, place/install, clean, and dispose of all the trash for all furniture and furnishings. It is the Prime Contractor's responsibility to coordinate the building completion, occupancy, and furniture installation dates with the installation dealer(s) specified in the FF&E package. Any costs associated with or delaying furniture shipments is the responsibility of the Prime Contractor.

The Prime Contractor shall provide and coordinate all Building Systems (HVAC, Plumbing, Fire Protection, Communications, Electrical, Data, Architectural, etc. with the furniture plans and furniture installation. All outlets, switches, thermostats, etc. shall be fully accessible. All sprinkler heads, fire extinguishers, ADA, etc., clearances shall be accommodated.

### 3.2 Installation Warranty

All movable furnishings shall be installed in accordance with the manufacturer's instructions and warranty requirements. All movable furnishings shall be level and aligned. All doors, drawers and accessories shall be level and aligned to open, close and otherwise operate smoothly and securely.

All furniture shall be installed by the furniture manufacturer's dealer of record and not the Prime Contractor. The Government reserves the right to approve/disapprove the Prime Contractor's FF&E installers. In addition, installation dealer(s) must be located within a 100 mile radius of the project site unless approved by the Government Interior Designer. The Prime Contractor shall repair, to the Government's satisfaction, any/all damage to any facility finish that is a result of the furniture installation and correct all punch list items for the furniture/furnishings. The Prime Contractor shall obtain services of equipment specialists to install the electrical equipment, to include but not limited to televisions, Video Teleconference Equipment, ceiling mounted projectors and mission essential electronic equipment included in the FF&E package.

### 3.3 Ordering Documentation

Three copies and one binder copy of all ordering documentation shall be provided to the Contracting Officer including Factory Order number (FO), serial number and manufacture date (for A/V equipment and appliances), and warranty information.

### 3.4 Post Award Changes

After award of the FF&E turnkey modification, any request to change the FF&E items must be submitted to the Contracting Officer. The FF&E turnkey modification will have been accepted, priced, and negotiated as detailed in the final package. Those items will have been agreed to considering color, specific type and quality of material, price, sustainability, life cycle, and dealership service. The Government will require the Prime Contractor

to provide exactly those items. Should changes become necessary, careful consideration shall be essential to assure that equivalent quality, price and other aspects of the item are maintained. Otherwise, price adjustments must be negotiated. Coordination with building finishes and other FF&E items is required for all proposed and approved substitutions. The Prime Contractor shall obtain approval from the Contracting Officer and NAVFAC Interior Designer for any changes to the FF&E Package.

Post award FF&E manufacturer's price increases, beyond the pricing guarantee date, are the responsibility of the Prime Contractor and shall not be transferred to the Government.

### 3.5 Punch List

The Contractor, its Interior Designer (and A/V consultant or other specialty consultants, if applicable) shall attend at least one punch list site visit with the installation dealer(s), NAVFAC Interior Designer and the Base Representative/Activity Contact. The site visit shall identify all punch list items (at installation dealer's 98% completion). The GC shall conduct a second punchlist inspection (at 100% completion) with the FF&E and A/V providers, OICC MCI East representative and Base Property office representative to confirm that all punch list items have been resolved.

### 3.6 Interior Photography Submittal

Upon completion of the FF&E installation, the Contractor shall provide professional Interior Photography of the completed interior. The photographer must be in the business of specializing in architectural and interior photography. The submittal shall be a minimum of 6 photos. "Before" and "After" photos are required for all renovation projects. Permission for publishing and using the photos by NAVFAC is required. Images to be submitted on a CD as a JPEG or PDF with a resolution of no less than 300 dpi as well as 8x10 matte photographs. The photographs shall be taken prior to occupancy and staged with accessories as needed. Additional lighting may be needed to ensure quality images.

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SECTION 01 31 19.05 20

POST AWARD MEETINGS

05/13

PART 1 GENERAL

1.1 SUMMARY

This document includes post-award requirements for project kickoff and subsequent design and preconstruction meetings.

1.2 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Project Schedule; G

Performance Assessment Plan (PAP); G

CDW Facilitator Experience Resume; G

CDW Preliminary Concept Design; G

CDW Basis of Design with Cost Estimate; G

CDW Concept Design Report; G

1.3 POST AWARD KICKOFF MEETING

The Post Award Kickoff (PAK) meeting is made up of Contract Administration and Scheduling. If mutually beneficial to the Contractor and the Government, these elements may be addressed in a single meeting or multiple meetings.

1.3.1 PAK Meeting Schedule and Location

Within 21 calendar days after contract award, and prior to commencing work, meet with the Contracting Officer for the PAK meeting(s). The meeting shall be held at a specific time and place to be determined by the Contracting Officer.

1.3.2 PAK Meeting Outcomes

The meeting(s) outcomes are:

- a. Integrate the Contractor and all client representatives into the project team.
- b. Achieve consensus from the project team on any issues and concerns with the Contractor's technical proposal. The User(s) will make a presentation of their functional requirements. Achieve consensus that User's functional requirements are understood and will be implemented into the project design.

- c. Establish and explain policies and procedures for completion of a successful project.
- d. Establish clear lines of communication and points of contact for Government and Contractor team members.
- e. Establish clear expectations for the Concept Design Workshop.
- f. Establish project design schedule, design submittal packaging, and preliminary construction schedule in accordance with Section 01 32 17.05 20 NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD. Discuss design milestones and events that need to be included in the Quality Control Communication Plan.
- g. Establish procedure for design packages reviews, Contractor's resolution to comments, and Government's role in review of packages.
- h. Establish clear expectations and schedules for facility turnover, providing DD Form 1354 asset management records, eOMSI submittals, and training of Government maintenance personnel.

#### 1.3.3 PAK Meeting Contractor Attendees

The following Contractor key personnel shall attend the PAK meeting: Project Manager, Project Scheduler, Designer of Record (DOR) Representative(s), Superintendent, QC Manager, and DQC Manager. Optional attendees include: Principal, Assistant Project Manager, Design Staff representing each architectural/engineering discipline, major subcontractors and specialized supplemental QC personnel.

#### PAK Meeting Government Attendees

The following Government key personnel shall attend the Pak Meeting: Project Manager, Base Telephone, Utilities, Architectural Review Board, Mission Assurance, Fire Protection, Mechanical/Electrical, Base Property, Physical Security, PMTRASYS Contractor, SPAWAR Contractor, and End User.

#### 1.3.4 Contract Administration

Contract administration roles and responsibilities will be addressed.

#### 1.4 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, the Contractor and Subcontractors. Key personnel representing Base Facilities, the Designer of Record (DOR), principal individuals from NAVFAC MIDLANT and from the Resident Officer in Charge of Construction (ROICC) office, the project sponsor, and representative(s) of the facility user will be invited to participate in the partnering process. Key members of the Contractor and subcontractor teams, including senior management, must participate.

The partnership will draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget, on schedule, and without any safety mishaps.

#### 1.4.1 Formal Partnering

Provide and host the Partnering sessions with key personnel of the Project Team, including Contractor personnel and Government personnel. The Contractor shall pay all costs associated with the partnering effort including meeting room and other incidental items. The participants shall bear their own costs for meals, lodging and transportation associated with partnering.

Before a Partnering session, coordinate with the Facilitator all requirements for incidental items (such as audio-visual equipment, easels, flipchart paper, colored markers, note paper, pens/pencils, colored flash cards, etc.), and have these items available at the Partnering session. Provide copies of documents for distribution to all attendees.

The Facilitator shall be experienced in conducting Partnering Workshops, and shall be acceptable to both the Government and the Contractor. The Facilitator is responsible for leading the team in a timely manner and making sure that issues are identified and resolved. A list of Partnering Facilitators is available from the Contracting Officer.

##### 1.4.1.1 Initial Partnering Session

- a. Shall be a duration of one day minimum.
- b. Will include participants as listed under paragraph "PAK Meeting Attendees".
- c. Should be held at a location off base as agreed to by the partners.
- d. May take place with the PAK meeting.

##### 1.4.1.2 Follow-on Partnering Session(s)

- a. Shall be held quarterly or as agreed to by the partners.
- b. May be held concurrently with other scheduled meetings such as QC or scheduling.
- c. May be held at a location off base, the project site, or in government facilities on base.
- d. May include only participants required to resolve current issues.
- e. Will generally last a half day or less and may utilize electronic means if mutually acceptable to all parties.
- f. Will not require a facilitator unless desired by the partners.

#### 1.5 CONCEPT DESIGN WORKSHOP (CDW)

Provide a Concept Design Workshop (CDW) for this project. This effort will examine project functions and requirements, quality and life safety costs, analyze alternate design concepts, expose and resolve project issues, and develop the final conceptual design. The outcome of the CDW shall be an acceptable conceptual design including floor and site plans, signed by the client, Contractor and other key team members.

#### 1.5.1 CDW Meeting Attendees

The following Contractor key personnel shall attend the CDW: Project Manager, Project Scheduler, Cost Estimator, Design Staff representing each architectural/engineering discipline, Superintendent, QC Manager, and DQC Manager. Optional attendees include: Principal, Assistant Project Manager, major subcontractors and specialized supplemental QC personnel.

#### 1.5.2 General

##### 1.5.2.1 Facilitator

The Contractor will provide a Facilitator who is experienced in conducting Concept Design Workshops. Provide CDW Facilitator Experience Resume for approval prior to the CDW. The CDW Facilitator must be acceptable to the Contracting Officer. He or she will be responsible for leading the team in a timely manner, making sure that issues are pursued and resolved to the maximum extent possible, documenting meetings, organizing the design concept documents for on-site approval, and providing the CDW Concept Design Report.

##### 1.5.2.2 Contractor's Design Team

The primary functions of the Design Team will be to investigate, develop and present alternate design solutions. The entire Design Team will participate in all phases of the Concept Design Workshop effort and provide assistance to the Facilitator in development of the Concept Design Workshop Report, including most of the required documentation.

##### 1.5.2.3 Award Amount

With each alternate design solution the Contractor shall verify that the concept is within the contract award amount.

##### 1.5.2.4 CDW Concept Design Report

The CDW Concept Design Report will summarize the final conceptual design and will be produced almost entirely on-site during the workshop.

#### 1.5.3 Procedure

##### 1.5.3.1 Preliminary Work

The Contractor's Design Team shall complete the following prior to the on-site workshop:

- a. Review the contract documents and references explaining the project scope and history.
- b. Make arrangements for and provide an appropriate conference room convenient to the project site and/or Users for use by the Design Team and Government participants during the workshop.
- c. Four weeks following the Post Award Kickoff meeting, prepare 20 copies of a CDW Preliminary Concept Design (Concept #1), a Basis of Design, and a statement that the concept provided is within the award amount for distribution at the Concept Design Workshop.
- d. Facilitator shall conduct meeting with NAVFAC MIDLANT representatives

before the Concept Design Workshop to review preparations, relationships, and the status of work to be accomplished. Meeting may be conducted via telephone or other electronic means if mutually agreeable to all concerned.

- e. Resolve any outstanding issues regarding the CDW with the Contracting Officer.

#### 1.5.3.2 On-Site Workshop

The on-site workshop shall last a minimum of three working days, minimizing breaks so as to maintain momentum. The Design Team should expect longer than normal workdays and shall accomplish the following items during the on-site phase of the Concept Design Workshop.

- a. The Facilitator will describe the Concept Design Workshop process and review the workshop agenda. The user(s) will provide a functional presentation to reiterate to all participants the User(s) needs and desires. The intent is to make the design solution and issue resolution function-oriented.
- b. Present CDW Preliminary Concept Design Concept #1 and respond to questions.
- c. Participate in a comment/creative session to generate ideas to improve this project in the areas of function, quality and total life cycle cost, issue resolution and sustainable design within the award amount. It is often helpful to request User comments in writing so they may be considered, responded to, and presented at subsequent presentations. This iterative workshop will invariably lead to revisions to the design build teams initial response to the RFP. This design input should be planned to be incorporated into the project, so long as it is within scope and RFP intent.
- d. Create a revised concept design. Design concepts shall include drawings, sketches, and other graphics as necessary to fully describe the concept. Prepare at least 20 copies for distribution at all presentations.
- e. Repeat applicable steps as necessary. Usually two to three concepts are required. The final concept must be within the contract award amount.
- f. The final concept shall include the following:
  - 1. Site Plan: Show the layout of the proposed facility in relation to major landmarks. Show all buildings, access roads, parking, pedestrian walkways, roads, sidewalks, landscaping, and major utilities. Indicate major dimensions and orientation. Provide an analysis relating the proposed building site, size, and construction type to applicable codes and criteria.
  - 2. Building Floor Plans: Provide floor plans depicting functional utilization of spaces and furniture and equipment layout. Show room dimensions. Provide a Life Safety Code® analysis with the floor plan to identify required life safety and egress features.
  - 3. Perspective Sketches: Provide at least one sketch to show a perspective of major buildings. The sketch should not be

elaborate but must show the proposed form and massing, colors to be used, and an indication of materials used.

4. Mechanical Plans: Provide plans as necessary to show the essential work and intent of the design. Suggestions include equipment layouts, zones, etc.
  5. Electrical Plans: Provide plans as necessary to show the essential work and intent of the design. Suggestions include special light fixture types, locations, switching, power outlets and panelboard location. Provide electrical distribution single line diagram.
  6. **CDW Basis of Design with Cost Estimate**: Describe, in layman's terms, the intent of the design by discipline. Address material quality, energy efficiency and life cycle costs. Provide a statement that the concept presented can be constructed within the award amount.
  7. Sustainable Design: Demonstrate ability to achieve the required **Third certification for sustainability**.
  8. System Safety Engineering
- g. Prepare 20 copies of the final concept (drawings, basis of design and statement that the concept is within the award amount) for distribution at the final presentation.
- h. Dependent upon the project, the Concept Design Workshop Report is provided by the Facilitator, includes all items included in the final concept design and the following:
1. Endorsements: Include a copy of the signature/endorsement sheet.
  2. Comments: Include comments and resolutions concerning the final concept design.
  3. Executive Summary: Summarize the workshop, including how the various concepts differed and were improved during the workshop.
  4. Special Design Features: Identify and describe unique project needs and features, e.g., pile foundations, physical security, intrusion detection systems, access control, construction in humid climates, pollution abatement, etc.
  5. Architectural Compatibility Statement: Identify architectural style, materials, and color scheme; and indicate their compatibility with installation planning and design concepts established in the Base Exterior Architectural Plan.
  6. Environmental Summary: Provide a summary of environmental issues, listing completed actions and items requiring further coordination, waivers or permits.
  7. Supporting Project Documentation: Include data to support the development of the concept design, layout, and special features. Items should include: project scope discussion, minutes of meetings, function analysis work sheets, and economic and technical analyses of alternatives evaluated.

- i. Except for final comments, responses and endorsements, the final report should be completed (electronically) on site, before the final presentation. If requested by the NAVFAC MIDLANT Project Manager, be prepared to present up to 10 hard copies of the report at the conclusion of the workshop.
- j. Conduct a "front-to-back" comprehensive presentation of the final concept. Obtain user signatures on a conceptual design endorsement sheet, signifying approval of the concept design, subject to the final comments and their resolutions agreed to at the final presentation meeting.

#### 1.5.3.3 Concept Design Workshop Report

Within 14 calendar days after completion of the on-site Concept Design Workshop, the Design Team shall submit to the NAVFAC MIDLANT Project Manager an electronic copy of the Concept Design Workshop Report as one file in \*.PDF format.

#### 1.6 PERFORMANCE ASSESSMENT PLAN (PAP)

The Performance Assessment Plan (PAP) shall be used to document design innovation and budget management, provide performance feedback to the Contractor, and as a basis for interim and final evaluations in the Construction Contractor Appraisal System (CCASS) on-line database.

It is the intent of the Government to establish the PAP based on tangible, measurable indicators of outstanding contractor performance, and on commitments made in the Contractor's proposal. The initial PAP may be found on the NAVFAC Design-Build Request for Proposal Website in RFP PART 6 Attachments. Review and finalize the initial PAP during the Partnering Session. During the initial Partnering Session, the Government, the Contractor, the Designer-of-Record, and the Client will establish the PAP. Following the establishment of the PAP, the Contractor will present it, with his input, for update and discussion at project meetings which discuss project performance. Submit an updated PAP on a monthly basis with the invoice for that period as a minimum. A copy of the initial PAP is attached.

#### 1.7 PROJECT SCHEDULE

Provide in accordance with Section 01 32 17.05 20 NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD.

#### 1.8 DESIGN QUALITY ASSURANCE MEETINGS

After Government Quality Assurance (QA) of each Design Submittal has been completed, meet with the Government to discuss review comments for the specific design submittal.

Provide consolidated copies of all Government comments with annotations of Contractor's action beside them. Notify the Contracting Officer in writing within five (5) days after receipt of Government's comments if the Contractor disagrees with comments technically or interprets comments to exceed the requirements of the contract.

##### 1.8.1 Design QA Meeting Attendees

The following Contractor key personnel shall attend the design QA

meetings: Project Manager, QC Manager, and DQC Manager, and Contractor's Design Staff (architect and engineering disciplines related to topics to be discussed).

#### 1.8.2 Design QA Meeting Location

Meetings shall be located at the office of the Contracting Officer's QA Team or may be conducted at other locations or by electronic means if mutually acceptable to all parties.

#### 1.8.3 Minimum Design QA Meeting Agenda

Address all Government comments that are unresolved and present clarification or supporting information requested by the Contracting Officer's QA team during the previous meeting.

### 1.9 PRECONSTRUCTION MEETING

Meet with the Contracting Officer to discuss construction items of concern to the Government and the Contractor such as outages, storage, trailer location, disposal of construction debris, safety, etc. at a location to be determined by the Contracting Officer. The Preconstruction meeting may take place with the PAK meeting or at any time prior to mobilization and before any construction work begins.

### 1.10 RECURRING MEETINGS

#### 1.10.1 Quality Control and Production Meetings

Provide Quality Control and Production Meetings in accordance with Section 01 45 00.05 20 DESIGN AND CONSTRUCTION QUALITY CONTROL.

#### 1.10.2 Safety Meetings

Provide Safety Meetings in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

#### 1.10.3 eOMSI Meetings

Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) for requirements.

### 1.11 FACILITY TURNOVER PLANNING MEETINGS

Key personnel will meet to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the PAK Meeting and convene the Facility Turnover Meetings once the project has reached approximately 75% completion or three to six months prior to Projected Completion Date or Contract Completion Date (CCD), whichever comes first. The Contracting Officer's Representative will lead the meetings and guide the discussions based on an agenda provided by the Government. See attached "Facility Turnover Planning Meeting Agenda" for typical meeting agenda. The Facility Turnover effort shall include the following:

#### a. PAK Meeting

1. Contracting Officer's Technical Representative (COTR) will provide the Facility Turnover Checklist and the Contractor, Client, and



NAVFAC MIDLANT Representatives will compare Contractor's schedule to Facility Turnover Checklist to ensure all Contractor Checklist Items are included in the schedule and to discuss the scheduling impact of Client and NAVFAC Checklist Items.

2. Discuss the requirements of creating the Interim and Final DD Form 1354 to provide asset management records to the Government. Refer to Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES for requirements.

b. Facility Turnover Meetings

1. Fill in the Facility Turnover Checklist including Contractor, Client, and NAVFAC Checklist Items and assign a person to be responsible for each item and a due date. The Contracting Officer's Representative will facilitate the assignment of responsibilities and fill out the Facility Turnover Checklist. See attached Facility Turnover Checklist.
2. Review the Contractor's updated schedule. The Contractor and the Contracting Officer's Representative shall develop a POAM for the completion of all Contractor, Client, and NAVFAC Checklist items.
3. Confirm that all Facility Turnover Checklist items will be completed on time for the scheduled Facility Turnover.
4. The Contractor shall lead a discussion of the Final eOMSI submittal. Assign responsibility and schedule for the provision of all information necessary to complete the eOMSI Spreadsheet Workbook for facility turnover.
5. Schedule and coordinate the facility training of Government maintenance personnel.

1.11.1 Facility Turnover Meeting Attendees

The following key personnel shall attend the Facility Turnover Meetings: Contractor QC Manager, Design Quality Control Manager, Superintendent, Major Subcontractors, Designer-of-Record, Contracting Officer's Representative, Representative(s) of NAVFAC MIDLANT, the Facility Owner / Real Property Accounting Officer, Public Works Facility Maintenance Specialist, and the Client.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

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# **NAVFAC Red Zone Facility Turnover Planning Meeting**

## **AGENDA**

### **I. Introduction and Overview – Purpose**

**CM**

The purpose of the Facility Turnover Planning Meeting is to address elements within the project team's purview – schedule management, assure completed facility complies with contract requirements, and other contractual issues. Each member of the project delivery team (Client, NAVFAC, and the contractor) has critical responsibilities to ensure timely completion and turnover of the new facility and each member should execute the NRZ process to achieve this end. The NRZ process provides a final re-focusing of attention to details of those key elements critical for a successful construction contract completion. In implementing NRZ processes, the NAVFAC/Contractor/Client team take a collective "snapshot" of contract status, identifying remaining actions to be accomplished, and confirm required resources needed for successful contract completion and turnover to the Client.

The Facility Turnover Planning Meeting is a collaborative effort between the Client, NAVFAC, and the contractor and results in a completed "NRZ Checklist/POAM Items" list that identifies the major items (and their due dates) that must be completed by the Contractor, the Client and the NAVFAC team to ensure timely completion of the contract.

### **II. Attendees**

NAVFAC Echelon IV (PM); NAVFAC FEAD/ROICC Team (AROICC, CM, ET/QA, Contracting Officer); Client Team (Project Manager, Program Coordinator, User/Tenant); Contractor Team (Project Manager, Project Superintendent, CQC Manager)

### **III. Schedule to Completion (POAM)**

**Contractor**

### **IV. Schedule of Final Outfitting and Occupancy (POAM)**

**Client**

### **V. Critical feature(s) of project (POAM)**

**CM**

### **VI. Transfer of Maintenance Responsibility**

**CM**

### **VII. Systems training & O&M Manuals (POAM)**

**CQC Manager**

### **VIII. Other Items to include on NRZ checklists**

**All**

### **IX. Summary of Required Actions and Responsibility**

**CM**

***Guidelines for conducting Facility Turnover Planning Meeting are as follows:***

- a. Meeting is held at approximately 75% construction contract completion or three to six months prior to BOD. NAVFAC representatives will include the Project Manager, Construction Manager/AROICC (CM) and Design Manager (DM), as appropriate. The contractor representatives include applicable prime contractor staff and decision-makers from major subcontractors. Design-Build contractors will have A-E representatives attending. The Client should include representatives from Public Works Officer (PWO) staff, a Client scope and financial decision maker, a user tenant representative, a facility start-up person, and others such as SPAWAR, NMCI, telephone, and furniture contractor, etc.
- b. The purpose of the meeting is to plan the remaining work, identify critical project features that still need to be completed (such as “soft” construction contract requirements as shown on the NRZ Checklist/POAM Items), and to complete the filling out of the “NRZ Checklist/POAM Items”.
- c. The contractor, client and NAVFAC provide a POC and due date for each item on their checklist. The team fills in the checklists by selecting items applicable to the project, selects due dates on each item, and appoints a person who has responsibility to ensure the item gets completed by the due date. The CM will be responsible to monitor the milestones.

### **Facility Turnover Checklist Items**

The tables below provide typical Facility Turnover Checklist Items for Contractor and Contracting Officer's Technical Representative (COTR) actions (Tables 1, 2, and 3, respectively). Items listed on the checklists are required to remain on the checklists if they are part of the project/contract or required by construction convention. Items not listed on the checklists, but required in the contract or by construction convention, must be added to the checklists by the Contractor and the COTR. Checklists are applicable to all contracts no matter what Category of Work.

The checklist items, points of contact and due dates shall initially be determined by the Contractor and the COTR during the Facility Turnover Planning Meeting. During execution of the Facility Turnover process, the checklist shall be updated as required to properly reflect project requirements. For each item on the entire list, the COTR, with input from the Contractor, shall indicate date completed and initial to indicate completion of the item. If a party fails to complete an item by the due date, this should be noted on the checklist and a new due date established and indicated. The completed Facility Turnover Checklist Items shall be placed in the contract file. The Contractor shall coordinate his items in Table 1 with the items in Tables 2 and 3.

Table 1

Contractor Checklist Items	Point of Contact	Due Date	Actual Complete Date	COTR Initials	Notes
<b>a. Construction Completion Schedule</b>					
<b>b. Facility Delivery Closeout:</b>					
Duct Air Leakage Testing					
HVAC System Test & Balance					
ACATS Controls Testing					
Conduct Second Seasons TAB					
Electrical Systems Testing					
Final utility systems connections (power, water, etc.)					
Superchlorination of potable water systems					
Plumbing / Other Mechanical Testing					
Elevator Certification(s)					
Specialized Equipment & Systems Inspections (Boilers, UPV, etc.)					
Fire Protection Systems Inspections and Performance Verification					
Communications / IT Systems Testing					
Security Systems Testing					
Other Specified Building Performance Requirements					
<b>c. Other Contractor Items:</b>					
Delivery of O&M Manuals					
Delivery of Equipment/Product Warranty List/Tag					
O&M/OMSI Training of Navy Personnel					
Site Restoration, if applicable					
Landscaping Complete					

<b>Contractor Checklist Items</b>	<b>Point of Contact</b>	<b>Due Date</b>	<b>Actual Complete Date</b>	<b>COTR Initials</b>	<b>Notes</b>
Pre-Final Inspection					
Final Inspection and Acceptance					
Delivery of Spare Parts, Extra Stock, Special Tools, etc					
Delivery of As-Built Drawings					
Delivery of Utility Record Drawings (if applicable)					
Delivery of Utility As-Built Drawings (if applicable)					
Beneficial Occupancy Date (BOD)					
Final Demobilization and Clean-up Completed					
Remove Construction Fence & Associated Coordination					
Pre-warranty Conference					
Project Close-out Meeting					
Coordination and Delivery of Facility Signage					
Final Cleaning					
Replace Construction Lock Cores and Re-keying					
Punch List Completion					
Provide DD1354 to Government CM					

**Table 2**

<b>COTR Checklist Items for Coordination with the Client</b>	<b>Point of Contact</b>	<b>Due Date</b>	<b>Actual Complete Date</b>	<b>COTR Initials</b>	<b>Notes</b>
Modification to FSC or BOSC to maintain/service new facility -Telephone service contract -Utilities service contract -Custodial service contract					
Installation of communications for phones and computers					
NMCI Installations or other networks					
Delivery and installation of client furnished furniture					
Delivery and installation of client furnished equipment					
User move-in					
GFE status/delivery schedule (GFCL, GFGI)					
Coordination of Intrusion Detection Systems and Physical Security Equipment					
Process operating permits					
Recycled/recovered materials report					
Coordination of IT and Communication Infrastructure and Devices (incl. CAT IV)					
Ribbon-cutting ceremony					



**Table 3**

<b>COTR Checklist Items for Coordination with NAVFAC</b>	<b>Point of Contact</b>	<b>Due Date</b>	<b>Actual Complete Date</b>	<b>COTR Initials</b>	<b>Notes</b>
Client walk-thru prior to pre-final inspections, if appropriate					
Schedule client satisfaction post BOD follow-up					
Schedule Government inspections of specialized equipment (e.g., Boiler/pressure vessels, elevators, UPS, SCIF shielding requirements, medical certifications, generators/switchgear)					
Provide keying plan to contractor					
Confirm utilities availability for final connections by contractor					
Startup utilities					
Mechanical Acceptance					
Resolve contract modifications & requests for equitable adjustment					
Contractor final release					
Return unobligated funds					
Process final payment					
Process recycled/recovered materials report					
Closeout actions on construction permits (e.g., NPDES)					
A-E and Construction Contractor Evaluations (ACASS/CCASS)					
Contractor QC Evaluation					
Complete Installed Property List and DD 1354					
Sign & provide Interim DD1354 to activity Real Property Accountability Officer NLT BOD					

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# Performance Assessment Plan

## MONTHLY EVALUATION

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**MONTH:** \_\_\_\_\_ **YEAR:** \_\_\_\_\_

Evaluation Factor	Yes	No	N/A	Comments
<p><i><b>Experience of Personnel</b></i></p> <p>1. Did the team identified in the proposal actively participate in the project?</p> <p>2. If personnel substitutions were needed, was the degree of technical competence maintained?</p>				
<p><i><b>Working Relationships</b></i></p> <p>1. Did the Construction team participate in the design process (i.e. attend meetings, provide insight, etc.)? Were the coordination meetings between Construction and Design team personnel documented?</p> <p>2. Did the Design team participate in the construction process (i.e. attend CQC meetings, perform field oversight, etc.)? Were coordination meetings between Construction and Design team personnel documented?</p> <p>3. Did the collaboration between the Construction and Design Team deliver a high value innovative facility?</p> <ul style="list-style-type: none"> <li>- Were Total Operating Cost minimized</li> <li>- What LEED points can be obtained</li> <li>- Was energy efficiency optimized, and the energy goals exceeded.</li> </ul> <p>4. Was the budget management process clear; was an estimate submitted on time with each design submittal. Was the estimate updated to reflect the changes in the design submittal?</p> <p>5. Did the Contractor's team effectively manage the project budget and the User's requirements to meet the customer's needs? Was project budget and emphasis in cost control exhibited in the estimate? (Contractor to document in comments block</p>				

materials/systems innovations and provision of higher quality than required in the RFP Part 4)				
<i>Additional factors to be developed during Partnering.</i>				
<b>Quality Control</b>  1. Were re-submittals of design deliverables or construction rework required this month?  2. Were as built redlines updated this month?  <i>Additional factors to be developed during Partnering.</i>				
<b>Timely Performance</b>  1. Is the Contractor on schedule?  2. Is the Contractor maintaining the schedule? (Can the Government confirm the project is on schedule?)  3. Is the Contractor following his schedule?  <i>Additional factors to be developed during Partnering.</i>				
<b>Effectiveness of Management</b>  1. Did the Government need to intercede in resolving a subcontractor issue?  <i>Additional factors to be developed during Partnering.</i>				
<b>Compliance with Labor Standards</b>  1. Did payrolls have to be resubmitted this month due to inaccuracies or errors?  <i>Additional factors to be developed during Partnering.</i>				
<b>Compliance with Safety Standards</b>  1. Were there any lost time accidents this month?				



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SECTION 01 32 17.05 20

NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD

05/13

PART 1 GENERAL

1.1 DESCRIPTION

The Contractor is responsible for scheduling all design, procurement and construction. A single schedule shall logically incorporate all design and construction for the entire project. Unless otherwise indicated, the contractor may begin construction when design is signed, stamped and submitted to the Government via the Contractor's quality control organization.

Design activities shall include design decision points, design submittal packages, such as site and building, as well as design submittals, such as design development and final design. Review times for design development packages shall be included in the schedule. Refer to Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES for specific requirements.

If Government approval is required for any portion of a final signed and sealed design package prior to construction, that review time shall be included in the schedule. The schedule shall also include times for procurement, Contractor quality control and construction, acceptance testing and training. Refer to Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES to determine if any items require Government approval prior to construction; if any are required, that submittal review time shall be included in the schedule.

The schedule is a tool to manage the project, both for Contractor and Government activities. It will also be used to measure progress and to evaluate time extensions. If cost-loaded, it will provide the basis for progress payments.

The Contractor shall use the Critical Path Method (CPM) and the Precedence Diagram Method (PDM) to satisfy time and cost applications. For consistency, when scheduling software terminology is used in this specification, the terms in Primavera's scheduling programs are used.

1.2 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES, except as modified in this contract.

SD-01 Preconstruction Submittals

Qualifications; G

Design Baseline Network Analysis Schedule (NAS); G

Construction Baseline Network Analysis Schedule (NAS); G

SD-07 Certificates

Monthly Network Analysis Schedule Updates; G

Three-Week Look Ahead Schedule; G

SD-11 Closeout Submittals

As-Built Schedule; G

### 1.3 SCHEDULE ACCEPTANCE PRIOR TO START OF WORK

Review comments made by the Government on the Contractor's schedule(s) will not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for scheduling, sequencing, and prosecuting the Work to comply with the requirements of the Contract Documents.

The Design Baseline Network Analysis Schedule (NAS) shall be submitted and presented to the Government at the PAK Meeting. The acceptance of a Design Baseline NAS is a condition precedent to processing Contractor's pay request(s) for design activities/items of work.

Only bonds shall be paid prior to acceptance of the Design Baseline Network Analysis Schedule (NAS).

The most current updated design schedule shall accompany each design submittal.

The Contracting Officer and Contractor shall participate in a preliminary meeting(s) to discuss the proposed schedule and requirements of this section prior to the Contractor preparing the Construction Baseline Network Analysis Schedule (NAS).

The acceptance of a Construction Baseline NAS is a condition precedent to:

- a. The Contractor starting work on the demolition or construction stage(s) of the contract.
- b. Processing Contractor's pay request(s) for construction activities/items of work.
- c. Review of any schedule updates

Submittal of the Baseline Network Analysis Schedules, and subsequent schedule updates, shall be understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work shall be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

### 1.4 SOFTWARE

Use the scheduling software Primavera Project Planner (P3)<sup>TM</sup>, Current Version, or Primavera SureTrak<sup>TM</sup>, Current Version, by Primavera Systems, Inc. or current mandated scheduling program. Save files in Concentric P3 or current mandated scheduling program file format, compatible with the Government's version of the scheduling program. Importing data into P3/SureTrak/current mandated scheduling program using data conversion techniques or third party software will be cause for rejection of the submitted schedule.



## 1.5 QUALIFICATIONS

The designated Scheduler for the project shall have prepared and maintained at least 3 previous schedules of similar size and complexity as this contract using SureTrak/P3 or current mandated scheduling program. A resume outlining the qualifications of the Scheduler shall be submitted for acceptance to the Contracting Officer. Payment will not be processed until an acceptable Scheduler is provided.

## 1.6 NETWORK SYSTEM FORMAT

The system shall include time scaled logic diagrams and specified reports.

### 1.6.1 Diagrams

Provide Time-scaled Logic Diagram printed in color on ANSI D size sheets. The diagram shall clearly show activities on the critical path. Include the following information for each activity:

- a. Activity ID
- b. Activity Description
- c. Original Duration in Work Days
- d. Remaining duration
- e. Percent Complete
- f. Early Start Date
- g. Early Finish Date
- h. Total Float

### 1.6.2 Schedule Activity Properties and Level of Detail

The NAS shall identify all Design, Government, Construction Quality Management (CQM), Construction activities planned for the project and all other activities that could impact project completion if delayed. Separate activities shall be created for each Phase, Area, Floor Level and Location the activity is occurring. Activity categories included in the schedule are specified below.

With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, no activity shall be open-ended; each activity shall have predecessor and successor ties. Once an activity exists on the schedule it may not be deleted or renamed to change the scope of the activity and shall not be removed from the schedule logic without approval from the Contracting Officer. The ID number for a deleted activity shall not be re-used for another activity. No more than 20 percent of the activities shall be critical or near critical. Critical is defined as having zero days of Total Float. "Near Critical" is defined as having Total Float of 1 to 14 days. Contractor activities shall be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

#### 1.6.2.1 Activity Categories

- a. Design Activities: Design activities shall include design decision points, design submittal packages, including any critical path submittals for Fast Tracked Phases. Review times for design development packages shall be included in the schedule. Refer to [Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES](#) for specific requirements.
- b. Procurement Activities: Examples of procurement activities include, but are not limited to; Material/equipment submittal preparation, submittal and approval of material/equipment; material/equipment fabrication and delivery, and material/equipment on-site. As a minimum, separate procurement activities will be provided for critical items, long lead items, items requiring government approval and material/equipment procurement for which payment will be requested in advance of installation. The Contractor shall show each delivery with relationship tie to the Construction Activity specifically for the delivery.
- c. Government Activities: Government and other agency activities that could impact progress shall be clearly identified. Government activities include, but are not limited to; Government approved submittal reviews, Government conducted inspections/tests, environmental permit approvals by State regulators, utility outages, Design Start, [Construction Start \(including Design/Construction Start for each Fast-Track Phase\)](#), and delivery of Government Furnished Material/Equipment.
- d. [Contractor Quality Management \(CQM\)](#) Activities: CQM Activities shall identify the Preparatory Phase and Initial Phase for each Definable Feature of Work identified in the Contractor's Quality Control Plan. These activities shall be added to each Three-Week Look Ahead Schedule referenced in the paragraph entitled "THREE-WEEK LOOK AHEAD SCHEDULE" and will also be included in each monthly update. The Follow-up Phase will be represented by the Construction Activities in the Baseline Schedule and in the schedule updates.
- e. Construction Activities: No on-site construction activity shall have a duration in excess of 20 working days. Separate construction activities shall be created for each Phase, Area, Floor Level and Location [where](#) the activity is occurring. Contractor activities shall be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days, unless otherwise defined in this contract.
- f. Turnover and Closeout Activities: Include a separate section with all items on the ["Facility Turnover Checklist"](#) that are applicable to this project. The [initial](#) checklist will be provided [with the bid documents](#). As a minimum, this will include all testing, specialized inspection activities, Pre-Final inspection, Punch List Completion, Final Inspection and Acceptance. Add a milestone for the Facility Turnover Planning Meeting at approximately 75% construction contract completion or three to six months prior to [Projected Completion Date or Contract Completion Date \(CCD\)](#), whichever is sooner.

#### 1.6.2.2 Contract Milestones and Constraints

- a. Project Start Date Milestones: The Contractor shall include as the first activity on the schedule a start milestone titled "Contract

Award", which shall have a Mandatory Start constraint equal to the Contract Award Date.

- b. **Projected Completion Date** Milestone: The Contractor shall include an unconstrained finish milestone on the schedule titled "Projected Completion". Projected Completion is defined as the point in time the Government would consider the project complete and ready for its intended use. This milestone shall have the Contract Completion (CCD) milestone as its only successor.
- c. **Contract Completion Date (CCD)** Milestone: The Contractor shall include as the last activity on the schedule a finish milestone titled "Contract Completion (CCD)", which shall have a Mandatory Finish constraint equal to the current Contract Completion Date. Calculation of schedule updates shall be such that if the finish of the "Projected Completion" milestone falls after the contract completion date, then negative float will be calculated on the longest path and if the finish of the "Projected Completion" milestone falls before the contract completion date, the float calculation shall reflect positive float on the longest path. The only predecessor to the Contract Completion Date Milestone shall be the Projected Completion **milestone**.

#### 1.6.2.3 Activity Code

At a minimum, the Contractor shall establish activity codes identified in this specification and 3 additional activity codes identified by the Contracting Officer. Once established, activity codes and values cannot be changed without approval by the Contracting Officer.

- a. **Phase:** All activities shall be assigned a 4-digit code value based on the contract phase it occurs in.
- b. **Area Code:** All activities shall be assigned an area code value identifying the Area in which the activity occurs. Activities shall not belong to more than one area. Area is defined as a distinct space, function or activity category; such as, separate structure(s), sitework, project summary, construction quality management, material/equipment procurement, etc.
- c. **Work Item:** All activities in the project schedule shall be assigned a 4-digit Work Item code value. Examples of Work Item code values include but are not limited to water lines, drain lines, building pad and foundation, slab on grade, walls and columns, suspended slab, roof structure, roofing, exterior finish systems, interior rough-in, and finishes, etc.
- d. **Location 1:** Assign a 4-digit Location 1 code value to activities associated with multistory structures. Code values are used to identify the floor level where an activity is occurring.
- e. **Location 2:** Assign a 4-digit Location 2 code value to all activities to identify the location within an Area, Work Item or Building Level that an activity is occurring.
- f. **Responsibility Code:** All activities in the project schedule shall be identified with the party responsible for completing the task. Activities shall not belong to more than one responsible party.

#### 1.6.2.4 Anticipated Weather Delays

The Contractor shall use the National Oceanic and Atmospheric Administration's (NOAA) historical monthly averages for the NOAA location closest to the project site as the basis for establishing a "Weather Calendar" showing the number of anticipated non-workdays for each month due to adverse weather, Saturdays, Sundays and all Federal Holidays as non-work days.

Assign the Weather Calendar to any activity that could be impacted by adverse weather. The Contracting Officer will issue a modification in accordance with the contract clauses, giving the Contractor a time extension for the difference of days between the anticipated and actual adverse weather delay if the number of actual adverse weather delay days exceeds the number of days anticipated for the month in which the delay occurs and the adverse weather delayed activities critical to contract completion. A lost workday due to weather conditions is defined as a day in which the Contractor cannot work at least 50 percent of the day on the impacted activity.

#### 1.6.2.5 Cost Loading

- a. Cost Loading Activities: Costs for incremental design preparation shall be assigned to the respective design phase submittal milestone(s). Material and Equipment Costs for which payment will be requested in advance of installation shall be assigned to their respective procurement activity (i.e., the material/equipment on-site activity). All other construction costs shall be assigned to their respective Construction Activities. The value of inspection/testing activities will not be less than 10 percent of the total costs for Procurement and Construction Activities. Evenly disperse overhead and profit to each activity over the duration of the project.
- b. Quantities and Units of Measure: Each cost loaded activity shall have a detailed quantity breakdown and unit of measure.

#### 1.6.3 Schedule Software Settings and Restrictions

- a. Activity Constraints: Date/time constraint(s), other than those required by the contract, will not be allowed unless accepted by the Contracting Officer. Identify any constraints proposed and provide an explanation for the purpose of the constraint in the Narrative Report.
- b. Default Progress Data Disallowed: Actual Start and Actual Finish dates on the CPM schedule shall match the dates on the Contractor Quality Control and Production Reports.
- c. Software Settings: Schedule calculations and Out-of-Sequence progress (if applicable) shall be handled through Retained Logic, not Progress Override. All activity durations and float values will be shown in days. Activity progress will be shown using Remaining Duration. Default activity type will be set to "Task". The project "Must Finish By" date shall be left blank.

#### 1.6.4 Required Tabular Reports

The following reports shall be included with the schedule and update submittals:

- a. Log Report: Listing of all changes made between the previous schedule and current updated schedule.
- b. Narrative Report: Identify and justify:
  - 1. Progress made in each area of the project.
  - 2. Critical Path.
  - 3. Date/time constraint(s), other than those required by the contract.
  - 4. Changes in the following; added or deleted activities, original and remaining durations for activities that have not started, logic, milestones, planned sequence of operations, critical path, and cost loading.
  - 5. Any decrease in previously reported activity Earned Amount.
  - 6. Pending items and status thereof, including permits, change orders, and time extensions.
  - 7. Status of Contract Completion Date and interim milestones.
  - 8. Current and anticipated delays (describe cause of delay and corrective actions(s)).
  - 9. Description of current and future schedule problem areas.

Each entry in the narrative report will cite the respective Activity ID and Activity Description, the date and reason for the change, and description of the change.

- c. Earned Value Report: Listing all activities having a budget amount cost loaded. Compilation of total earnings on the project from notice to proceed to current progress payment request. Group and sort activities as directed by the Contracting Officer. Show current budget, previous physical percent complete, to-date physical percent complete, previous earned value, to-date earned value and cost to complete on the report for each activity.
- d. Schedule Variance Control (SVC) Diagram: With each schedule submission, provide a SVC diagram showing:
  - 1. Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates.
  - 2. Earned Value to-date.

Revise Cash Flow S-Curves when the contract is modified, or as directed by the Contracting Officer.

#### 1.7 SUBMISSION AND ACCEPTANCE

The Design Baseline NAS shall include detailed design activities, general (summarized) approach for the construction phase(s) of the project and required milestone activities. If the project is being Fast-Tracked or allows Early Start of construction, the Design Baseline Project Schedule shall include all fast-tracked design construction phases, etc., including the required or proposed critical path design submittals within each phase

that shall occur during the duration of the project.

The Contractor shall develop the **Construction Baseline Schedule with detailed construction activities as design progresses**. If design must be completed and accepted prior to construction, submit the complete design and construction network analysis schedule and obtain acceptance prior to starting construction work. If the project will be Fast-Tracked, each construction stage shall be detailed and built upon the previous Fast-Tracked Baseline Schedule (including any interim updates) and accepted prior to starting that stage of the construction work. Payment for completed work is dependent on an accepted, detailed schedule for that portion of work.

#### 1.7.1 Monthly Network Analysis Schedule Updates

Contractor and Government representatives shall meet at monthly intervals to review and agree on the information presented in the updated project schedule. The submission of an acceptable, updated schedule to the Government is a condition precedent to the processing of the Contractor's pay request. If a Schedule of Prices is the basis for progress payments, it shall be consistent with the logic and activity breakdowns on the progress schedule. If progress payments are based on a cost-loaded schedule, the Contractor and Government shall agree on percentage of payment for each activity progressed during the update period.

Provide the following with each Schedule submittal:

- a. Time Scaled Logic Diagram.
- b. Reports listed in paragraph entitled "Required Tabular Reports."
- c. Data disks containing the project schedule. Include the back-up native .prx/current mandated schedule program files.

#### 1.7.2 As-Built Schedule

As a condition precedent to the release of retention and making final payment, submit an "As-Built Schedule," as the last schedule update showing all activities at 100 percent completion. This schedule shall reflect the exact manner in which the project was actually constructed.

#### 1.8 CONTRACT MODIFICATION

Submit a Time Impact Analysis with each cost and time proposal for a proposed change. Time Impact Analysis (TIA) shall illustrate the influence of each change or delay on the Contract Completion Date or milestones. No time extensions will be granted nor delay damages paid unless a delay occurs which consumes all available Project Float, and extends the Projected Finish beyond the Contract Completion Date.

- a. Each TIA shall be in both narrative and schedule form demonstrating the delay impact. The TIA shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. The Contractor shall run the schedule calculations and submit the impacted schedule with the proposal or claim.
- b. The TIA schedule submitted with the proposal shall show all activity progress as of the date of the proposal. If the impact to the schedule occurs prior to the proposal submission, the TIA schedule shall be

updated to show all activity progress as of the time of the impact. If the proposed change does not impact the CCD, no TIA shall be required.

- c. Submit Data disks containing the TIA schedule. Include the back-up native .prx/current mandated schedule program files.
- d. Unless the Contracting Officer requests otherwise, only conformed contract modifications shall be added into the Project NAS.

#### 1.9 FLOAT

Project Float is the length of time between the Contractor's Projected Finish Milestone and the Contract Completion Date Milestone. Project Float available in the schedule, at any time shall not be for the exclusive use of either the Government or the Contractor.

#### 1.10 THREE-WEEK LOOK AHEAD SCHEDULE

The Contractor shall prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Project Network Analysis Schedule. The work plans shall be keyed to NAS activity numbers and updated each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, preparatory meetings, and initial meetings. Identify critical path activities on the Three-Week Look Ahead Schedule. The detail work plans are to be bar chart type schedules, maintained separately from the Project NAS on an electronic spreadsheet program and printed on 8.5 by 11 inch sheets as directed by the Contracting Officer. Activities shall not exceed 5 working days in duration and shall have sufficient level of detail to assign crews, tools and equipment required to complete the work. Three hard copies and one electronic file of the 3-Week Look Ahead Schedule shall be delivered to the Contracting Officer no later than 8 a.m. each Monday and reviewed during the weekly CQC Coordination Meeting.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

-- End of Section --

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SECTION 01 33 00.05 20

CONSTRUCTION SUBMITTAL PROCEDURES  
05/13

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

This section covers construction submittals that are not included in the design submittals. Submit design submittals in accordance with 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES. When using Unified Facility Guide Specifications (UFGS) sections that reference Section 01 33 00 SUBMITTAL PROCEDURES, change reference to this section, Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

1.2 SUBMITTAL DESCRIPTIONS (SD)

Submittal requirements are specified in Unified Facilities Guide Specifications (UFGS) in Part 2, GENERAL REQUIREMENTS; in references in Part 4 PERFORMANCE TECHNICAL SPECIFICATIONS; and in UFGSs in Part 5, PRESCRIPTIVE SPECIFICATIONS. Submittals that are identified by SD numbers use descriptions of items included in submittal packages and titles as follow:

SD-01 Preconstruction Submittals

- Certificates of insurance.
- Surety bonds.
- List of proposed subcontractors.
- List of proposed products.
- Construction Progress Schedule.
- Submittal register.
- Schedule of values.
- Health and safety plan.
- Work plan.
- Quality control and Commissioning plan.
- Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

#### SD-04 Samples

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuing work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

#### SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

#### SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily checklists.

Final acceptance test and operational test procedure.

#### SD-07 Certificates

Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

#### SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

#### SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

#### SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

#### SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings, As-built drawings, DD Form 1354, and Sustainable and Energy Data Record Card. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

### 1.3 SUBMITTALS

The use of a "G" following a submittal indicates that an approval action is required, either by the Government or by the Contractor's Designer of Record (DOR) or QC Specialist.

Submit the following in accordance with the requirements of this section.

#### SD-01 Preconstruction Submittals

Submittal Register Format; G

Submittal Register; G

#### 1.3.1 Submittal Register

The submittal register will be prepared during the initial design stages of the project and indicate each design and construction submittal. Maintain an electronic version of the submittal register as work progresses. The DOR must assist the DQC in preparing the submittal register by determining all project submittals that require DOR approval. The Contractor proposed [submittal register format](#) must include all types of information pertinent to the submittal process and be approved by the Contracting Officer prior to the first submission.

#### 1.4 CONSTRUCTION QUALITY CONTROL

##### 1.4.1 Contractor Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with the contract requirements.

In RFP PART 4 PERFORMANCE TECHNICAL SPECIFICATIONS (PTS), there are UFGS specification sections required to be submitted as part of the design submittal. Unless specified otherwise in this section, the Contractor's DOR is the approving authority for submittals listed in these UFGS specifications with a "G" designation, unless the DOR delegates to Contractor Quality Control approval. RFP Part 4 PTS sections also include submittals identified for DOR approval that are not denoted with a "G" designation, these submittals cannot be delegated for Contractor Quality Control approval.

If RFP PART 5 PRESCRIPTIVE SPECIFICATIONS are utilized in this RFP, the Contractor's DOR is the approving authority for submittals listed with a "G" designation, unless the DOR delegates to Contractor Quality Control approval.

Submittal items identified in RFP PARTS 2, 4, and 5 that are not identified with a "G" designation or not designated for DOR approval (in RFP Part 4) are for Contractor Quality Control approval.

Construction submittals that are approved by the DOR or certified by the QC are not required to be submitted to the Government for surveillance, except where specified in paragraph SUBMITTALS RESERVED FOR GOVERNMENT SURVEILLANCE.

Construction submittals not requiring Government approval or surveillance shall be submitted for information.

##### 1.4.2 Submittals Reserved for Government Approval

The Government is the approving authority for submittals with a "G" designation in RFP Part 2 GENERAL REQUIREMENTS specification sections. Comply with additional Government approval requirements for Environmental submittals, as specified in RFP Part 2, Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS and 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

In addition to the Government approvals required by RFP Part 2 GENERAL REQUIREMENTS, the following submittals shall be certified by the QC Manager and the DOR, and approved by the Contracting Officer.

- a. FIRESTOPPING; All fire protection system submittals; G
- b. INTERIOR FIRE ALARM SYSTEM; All fire protection system submittals; G
- c. FIRE SUPPRESSION SPRINKLERS; All fire protection system submittals; G
- d. BACnet DIRECT DIGITAL CONTROL SYSTEMS FOR HVAC; SD-06 field test report submittals; G
- e. HVAC TESTING/ADJUSTING/BALANCING; All submittals; G
- f. PAD-MOUNTED TRANSFORMERS; All submittals; G

- g. SUBSTATIONS; All submittals; G
- h. SWITCHGEAR; All submittals; G
- j. Section 27 10 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM: All submittals. Provide an information copy of all submittals to Base Telephone through the Contracting Officer. Base Telephone will coordinate their review and approval through the Marine Corps North Carolina IPT.
- k. Section 33 82 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP): All submittals. Provide an information copy of all submittals to Base Telephone through the Contracting Officer. Base Telephone will coordinate their review and approval through the Marine Corps North Carolina IPT.

#### 1.4.2.1 Scheduling for Government Approved Submittals

Except as specified otherwise, allow review period, beginning when Government receives submittal from the QC organization, of 20 working days for return of submittal to the Contractor. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization. Period of review for each resubmittal is the same as for initial submittal.

#### 1.4.3 Submittals Reserved for Government Surveillance

Surveillance submittals are approved by the Contractor in accordance with paragraph CONTRACTOR REVIEWING, CERTIFYING, AND APPROVING AUTHORITY, but provide the Government the opportunity to oversee critical project issues.

If during the Government surveillance of construction submittals, items are brought to the Contractor's attention as non-compliant, the Contractor shall correct the submittal and construction to comply with the requirements of the RFP. Stamp surveillance submittals "APPROVED" by the DOR or QC Specialist and "FOR SURVEILLANCE ONLY." Submit the following Government surveillance submittals, prior to starting work for construction submittal items, and after the completion of the work for reports submittals items.

- a. Submit fire protection related submittals pertaining to spray-applied fire proofing and fire stopping, exterior fire alarm reporting systems, interior fire alarm & detection systems, and fire suppression systems including fire pumps and standpipe systems.
- b. Submit geotechnical related submittals pertaining to the soils investigations (reports and soils analysis), foundations (shallow and deep), pavements structure design, test pile and production pile testing and installation.
- c. Submit conveying related submittals pertaining to elevators, escalators, weight handling equipment, lifts, and conveyors.
- d. Submit roofing submittals pertaining to materials and systems used to make up the roof system.
- e. Submit HVAC Testing, Adjusting, and Balancing required submittals.

- f. Submit telecommunications shop drawings, as described in Part 4, D50 ELECTRICAL, for coordination with the MCW or NEXGEN Contractor.
- g. Submit Performance Verification and Acceptance Testing submittals listed in the PTS and referenced UFGS.
- h. Submit all Interim Special Inspection Reports on a bi-weekly basis until work requiring special inspections is complete. Submit all Structural Observation Reports and the Final Report of Special Inspections.
- i. Submit Final Certification Documentation for either US Green Building Council (USGBC) Certification LEED or Green Building Initiative (GBI) Green Globes.
- j. Submit building envelope testing results for air tightness and the Infrared Thermography results if air barrier deficiencies are identified. Actions taken to correct building envelope deficiencies at each location.

#### 1.4.4 Constraints

- a. Submittals shall be complete for each definable feature of work; submit components of definable feature interrelated as a system at the same time.
- b. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

#### 1.4.5 Design Change and Variation

The Contractor must limit change and variation to items that will be advantageous to the Government. Submit proof that the change or variation is needed and provide the same or better level of quality as the design that the Government originally reviewed or approved. Design change is considered prior to Government approval of the final design and variation is considered after Government approval of final design. Documentation provided to the Government shall include coordination measures proposed to incorporate the design change or variation into the construction.

##### 1.4.5.1 Design Change

Design change must meet the minimum requirements of the solicitation and the accepted proposal. Change from what was reviewed by the Government during design must be approved by the Designer of Record and brought to the attention of the Government before the design change is incorporated into the design documents.

##### 1.4.5.2 Variations

Variations from contract requirements including the solicitation, the accepted proposal, and the final design, requires Government approval. Variations to the contract requirements must be approved by the Designer of Record prior to resubmitting the design to the Government for approval of the variation.

#### 1.4.6 Contractor's Responsibilities

Ensure no work has begun until submittals for that work have been

"approved" or "approved as noted."

#### 1.4.7 QC Organization Responsibilities

Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

- a. When approving authority is Contracting Officer, QC organization will certify submittals, assure proper signatures, and forward to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number (insert contract number here), is in compliance with the contract documents, can be installed in the allocated spaces, and is submitted for Government approval.

RFP Part Two Submittals:

Certified by QC Manager \_\_\_\_\_, Date \_\_\_\_\_  
(QC Manager)

RFP Part Four and Part Five Submittals:

Certified by DOR \_\_\_\_\_, Date \_\_\_\_\_

Certified by QC Manager \_\_\_\_\_, Date \_\_\_\_\_"

1. Sign certifying statement or approval statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.
  2. Update submittal register database as submittal actions occur and maintain the [submittal register](#) at project site until final acceptance of all work by Contracting Officer.
  3. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.
- b. When the Approving Authority is Designer of Record, the DOR shall approve, professionally stamp, sign, and date submittals. DOR stamp on construction [submittals indicates](#) DOR approval for construction. QC organization will certify submittals, assure proper signatures, and forward to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number (insert contract number here), is in compliance with the contract requirements, can be installed in the allocated spaces, and is submitted for DOR approval.

RFP Part Four and Part Five Submittals:

Approved by DOR \_\_\_\_\_, Date \_\_\_\_\_

Certified by QC Manager \_\_\_\_\_, Date \_\_\_\_\_"

1. Sign certifying statement or approval statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.
2. Update submittal register database as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.
3. Send copies of final DOR or QC Specialist approved and signed submittals that are identified in this section for Government surveillance to the Contracting Officer. Stamp copies "For Surveillance Only."

#### 1.4.8 Government's Responsibilities

When approving authority is the Contracting Officer, the Government will:

- a. Note date on which submittal was received from QC Manager, on each submittal.
- b. Review submittals for compliance with contract documents.

##### 1.4.8.1 Government Actions

Submittals will be returned with one of the following notations:

- a. Submittals marked "approved" or "approved as submitted" authorize Contractor to proceed with work covered.
- b. A submittal marked "not reviewed" will be returned with an explanation of the reason it was not reviewed.
- c. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize Contractor to proceed with work as noted provided Contractor takes no exception to the notations.
- d. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- e. Submittals required for surveillance will be returned only if corrective actions are required.

#### 1.5 FORMAT OF SUBMITTALS

##### 1.5.1 Transmittal Form

Transmit submittals with transmittal form prescribed by Contracting Officer and standard for the project.



### 1.5.2 Electronic Submittals

Construction Submittals for this project shall be made electronically utilizing software provided by the Contractor and approved by the Government and the DOR. Electronic Working and Record Drawings shall be submitted in accordance with specification section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES. Provide eOMSI submittals in accordance with specification section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI).

#### 1.5.2.1 Identification and Information

Identify and incorporate information in each electronic submittal file as follows:

- a. Assemble complete submittal package into a single indexed electronic file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
- b. Name file with the project identifier and Specification Section number, and submittal number, including revision identifier if required as follows:

File name shall use project P-number followed by a dash, the six or ten digit Specification Section number followed by a dash, and then a sequential number (e.g., P601-04 20 00-001 or P601-07 21 00.00 20-001). Resubmittals shall include an alphabetic suffix after the sequential number (e.g., P601-04 20 00-001A or P601-07 21 00.00 20-001A).

#### 1.5.2.2 General Electronic Submittal Procedure Requests

Post electronic submittals as PDF electronic files directly to Contractor's project electronic site specifically established for the Project.

- a. DOR will post electronic annotated files.
- b. Contractor shall annotate and retain one copy of file as an electronic Project record document file.
- c. Contractor shall maintain three (3) hard copies of all submittals: one copy to be maintained in the field during construction, one for the Construction Management Engineer (CME) office, and one for the contract files.
- d. Contractor shall provide upon completion of the project, CDs which have all reviewed and marked up submittals for the project.

### 1.6 QUANTITY OF SUBMITTALS

#### 1.6.1 1.6.1 Quantity of Submittals Reserved for Government Approval

Submit **four** copies of submittals of shop drawings requiring review and approval by Contracting Officer.

1.6.2 Quantity of Submittals Reserved for Government Surveillance

Submit **three** copies of submittals specified for surveillance to the Contracting Officer **if not electronically submitted.** .

**1.6.3 Quantity of Submittals for Information**

**Submit two copies of submittals for information to the Contracting Officer.**

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 10.05 20

DESIGN SUBMITTAL PROCEDURES

11/13

PART 1 GENERAL

1.1 SUMMARY

This section includes requirements for Contractor-originated design documents and design submittals.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. The latest version of the publication at time of award shall be used.

MCB CAMP LEJEUNE

BEAP (2010) MCB Camp Lejeune Base Exterior  
Architectural Plan

GREEN BUILDING INITIATIVE (GBI)

GBI GP Compliance GBI Guiding Principles Compliance Program  
for New Construction

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC Ref Guide (2009; R 2010) LEED Reference Guide for  
Green Building Design, Construction and  
Major Renovations of Commercial and  
Institutional Buildings including Core &  
Shell and K-12 Projects

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-200-01 (2013) General Building Requirements

UFC 1-200-02 (2013) High Performance and Sustainable  
Building Requirements

UFC 1-300-08 (2009, with Change 2) Criteria for  
Transfer and Acceptance of DoD Real  
Property

FC 1-300-09N (2014) Navy and Marine Corps Design  
Procedures

UFC 3-101-01 (2011) Architecture

UFC 3-110-03 (2012) Roofing

UFC 3-120-10 (2006; Change 1, 2007) Interior Design

UFC 3-201-01 (2013) Civil Engineering

UFC 3-201-02	(2009; Change 1, 2009) Landscape Architecture
UFC 3-210-10	(2010) Low Impact Development
UFC 3-220-01N	(2005) Geotechnical Engineering Procedures for Foundation Design of Buildings and Structures
UFC 3-301-01	(2013) Structural Engineering
UFC 3-310-04	(2013) Seismic Design for Buildings
UFC 3-401-01	(2013) Mechanical Engineering
UFC 3-400-02	(2003) Design: Engineering Weather Data
UFC 3-410-01	(2013) Heating, Ventilating, and Air Conditioning Systems
UFC 3-420-01	(2004; Change 8, 2009) Plumbing Systems
UFC 3-501-01	(2010; Change 2, 2012) Electrical Engineering
UFC 3-520-01	(2010; Change 2, 2012) Interior Electrical Systems
UFC 3-530-01	(2006; Change 3, 2013) Design: Interior, Exterior Lighting and Controls
UFC 3-550-01	(2010; Change 1, 2012) Exterior Electrical Power Distribution
UFC 3-560-01	(2006; Change 4, 2012) Electrical Safety, O&M
UFC 3-580-01	(2007) Telecommunications Building Cabling Systems Planning and Design
UFC 3-580-02	Exterior Telcom (Draft in Progress)
UFC 3-580-10	(2004; Change 12, 2005) Navy and Marine Corps Intranet (NMCI) Standard Construction Practices
UFC 3-600-01	(2006; Change 3, 2013) Fire Protection Engineering for Facilities
UFC 3-600-10N	(2007; Final Draft) Fire Protection Engineering
UFC 3-800-10N	(2006; Final Draft) Environmental Engineering for Facility Construction
UFC 4-010-01	(2012; Change 1, 2013) DoD Minimum Antiterrorism Standards for Buildings

UFC 4-010-02 (2012)DoD Minimum Antiterrorism Standoff  
Distances for Buildings (FOUO)

UFC 4-021-01 (2008; Change 1 2010) Design and O&M: Mass  
Notification Systems

### 1.3 GENERAL DESIGN REQUIREMENTS

Contractor-originated design documents shall provide a project design that complies with the Request For Proposal (RFP), FC 1-300-09N, UFC 1-200-01, the Core UFCs, and other UFC's listed below.

- a. UFC 1-200-01
- b. UFC 1-200-02
- c. UFC 1-300-08
- d. FC 1-300-09N
- e. UFC 3-101-01
- f. UFC 3-110-03
- g. UFC 3-120-10
- h. UFC 3-201-01
- i. UFC 3-201-02
- j. UFC 3-210-10
- k. UFC 3-220-01N
- l. UFC 3-301-01
- m. UFC 3-310-04
- n. UFC 3-401-01
- o. UFC 3-400-02
- p. UFC 3-410-01
- q. UFC 3-420-01
- r. UFC 3-501-01
- s. UFC 3-520-01
- t. UFC 3-530-01
- u. UFC 3-550-01
- v. UFC 3-560-01
- w. UFC 3-580-01
- x. UFC 3-580-10

- y. UFC 3-600-01
- z. UFC 3-600-10N
- aa. UFC 3-800-10N
- bb. UFC 4-010-01
- cc. UFC 4-010-02
- dd. UFC 4-021-01

#### 1.3.1 UNIFIED FACILITIES CRITERIA (UFC) Notes

UFC 1-200-01 including the referenced DoD Tri-Service Core UFC Documents and the required building codes/standards comprise the general building requirements for the project. These Core UFC documents apply to all facilities, and unless noted below, are found on the Whole Building Design Guide UFC website.

(UFC 1-200-01 is a hub document that provides general building requirements and references other critical UFCs.

UFC 1-200-01 requires compliance with UFC 1-200-02, "High Performance and Sustainable Building Requirements". UFC 1-200-02 replaces and cancels UFC 4-030-01, Sustainable Development and UFC 3-400-01, Energy Conservation.

A reference to UFC 1-200-01 or UFC 3-410-01 requires compliance with UFC 1-200-02, UFC 3-401-01, UFC 3-400-02, and UFC 3-420-01.

(A reference to UFC 1-200-01 or UFC 3-501-01 requires compliance with UFC 3-520-01, UFC 3-530-01, UFC 3-550-01, UFC 3-560-01, UFC 3-580-01, and UFC 3-580-02.)

(A reference to UFC 1-200-01 or UFC 3-580-02 requires compliance with UFC 3-501-01 and UFC 3-580-10.)

(A reference to UFC 1-200-01 or UFC 4-010-01 requires compliance with UFC 4-010-02 and UFC 4-021-01.)

(UFC 3-600-10N is only available on the NAVFAC Design-Build Website under the Design Guidance link: [http://www.wbdg.org/ndbm/design\\_guidance.php](http://www.wbdg.org/ndbm/design_guidance.php). This Draft UFC is applicable as a Final document for Navy projects.)

(UFC 3-800-10N is only available on the NAVFAC Design-Build Website under the Design Guidance link: [http://www.wbdg.org/ndbm/design\\_guidance.php](http://www.wbdg.org/ndbm/design_guidance.php). This Draft UFC is applicable as a Final document for Navy projects.)

#### 1.4 SUBMITTALS

Submit design submittals to the Government for approval. The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with this section and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Consolidated RFP Documents; G

Submittal Register; G

SD-05 Design Data

Design Drawings; G

Specifications; G

Design Analysis; G

Updated Draft DD Form 1354; G

Design Submittals; G

Sustainable Design; G

SD-07 Certificates

Third Party Certification (TPC) Documentation; G

Third Party Certification Registration Application; G

TPC Certification; G

SD-11 Closeout Submittals

Record Documents; G

NAVFAC Sustainable and Energy Data Record Card; G

Preliminary Interim DD Form 1354; G

Updated Interim DD Form 1354; G

1.5 DESIGN QUALITY CONTROL

1.5.1 Contractor Reviewing and Certifying Authority

The QC organization is responsible for reviewing and certifying that design submittals are in compliance with the contract requirements.

1.5.2 Government Approving Authority

The Contracting Officer is the approving authority for design submittals.

1.5.3 Designer of Record Certifying Authority

The Designer of Record (DOR), as registered and defined in FC 1-300-09N, is the design certifying authority. The DOR accepts responsibility for design of work in each respective design discipline, by stamping and approving final construction drawings submitted to the Government approval authority.

1.5.4 Contractor Construction Actions

Upon submission of sealed and signed design documents certified by the DOR, Design Quality Control (DQC) Manager and the Quality Control (QC) Managers, the Contractor may proceed with material and equipment purchases, fabrication and construction of any elements covered by that submittal,

except as specified in the following paragraph.

#### 1.5.4.1 Exception to Contractor Construction Actions

The Government will approve the following final submittals before the Contractor shall be allowed to proceed with construction:

- a. Any design submittal that includes or will be impacted by a variation to the contract. Final Government approval of the variation is required before construction can begin on the work included in that design submittal.
- b. This project includes design and construction of several spaces that support unique training apparatus, special, high-value systems, and, in the case of the Blackburn Ops Center and Computer Room, mission-critical capabilities. It is **essential** that the Contractor and its Designer-of-Record carefully and systematically coordinate technical requirements and Government-furnished systems in these spaces with the design and construction of the facilities. Close communication and coordination with the Users of these facilities is required for the Contractor and its Designer-of-Record to gain a complete understanding of requirements for all systems and construction in these spaces and to achieve the Customers' desired/satisfactory outcome for these areas. All design in these sensitive areas will require explicit Government approval before construction can begin on the work in these areas.

#### 1.5.5 Contractor's Responsibilities

- a. Designate a lead licensed architect or engineer to be in responsible charge to coordinate the design effort of the entire project. This lead architect or engineer shall coordinate all design segments of the project to assure consistency of design between design disciplines.
- b. With the Designer or Record, verify site information provided in the RFP. In addition, provide additional field investigations and verification of existing site conditions as may be required to support the development of design and construction of the project.
- c. Advise Contracting Officer of variations, as required by paragraph "Variations."
- d. Provide an updated, cumulative submittal register with each design package that identifies the design and construction submittals required by that design package and previous submittals.

#### 1.5.6 QC Organization Responsibilities

- a. Both the CA and the QC Manager must certify design submittals for compliance with the contract documents. The DOR stamp on drawings indicates approval from the DOR.
- b. QC organization shall certify submittals forwarded by the Designer of Record (DOR) to the Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with Contract Number (insert contract number here), is in compliance with the contract documents, and is submitted for Government approval.



Certified by Design Quality Control (DQC) Manager

\_\_\_\_\_, Date \_\_\_\_\_

Certified by QC Manager

\_\_\_\_\_, Date \_\_\_\_\_"

- c. Sign certifying statement. The persons signing certifying statements shall be the QC organization members designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.
- d. Update submittal register as submittal actions occur and maintain the submittal register at project site until final approval of all work by Contracting Officer.
- e. Retain a copy of approved submittals at project site.

#### 1.5.7 Government Responsibilities

The Government will

- a. Note date on which submittal was received from QC manager, on each submittal.
- b. Perform a quality assurance (QA) review of submittals. Government will notify Contractor when comments for that design package are posted and ready for Contractor evaluation and resolution.
- c. Upon submittal of final design package and resolution of comments by the Contractor, the Government will sign final design package, when approved, and return electronic copy of signed design documents to the Contractor.

##### 1.5.7.1 Actions Possible

Submittals will be returned with one of the following notations:

- a. Submittals may be marked "approved."
- b. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and certified by Contractor, or is not complete. Submittal will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.
- c. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. If work has been started on the unacceptable portion of the design submittal, the Contractor shall propose corrective action. No further work shall proceed until the issue is resolved in a manner satisfactory to the Government.

## 1.6 DESIGN DRAWINGS

### 1.6.1 Drawing Standards

Prepare, organize, and present design drawings in accordance with the requirements of FC 1-300-09N.

Submit all CADD files for the final drawings on CD-ROM disks in AutoCAD 2010 format. Drawing files shall be full files, uncompressed and unzipped.

### 1.6.2 Naval Facilities (NAVFAC) Engineering Command Drawing Numbers

Number the final Contractor-originated design drawings consecutively with NAVFAC drawing numbers. Determine the total number of sheets required for the complete set of drawings before requesting the NAVFAC drawing numbers from the Contracting Officer.

### 1.6.3 Seals and Signatures on Documents

All final Contractor-originated design drawings shall be signed, dated, and bear the seal of the registered architect or the registered engineer of the respective discipline in accordance with FC 1-300-09N. This seal shall be the seal of the Designer of Record for that drawing, and who is professionally registered for work in that discipline. A principal or authorized licensed or certified employee shall electronically sign and date final drawings and cover sheet, in accordance with FC 1-300-09N. The design drawing coversheets shall be sealed and signed by the lead licensed architect or engineer of the project design team. Indicate the Contractor's company name and address on the drawing coversheets of each design submittal. Application of the electronic seal and signature accepts responsibility for the work shown thereon.

### 1.6.4 Units of Measure

Utilize English Inch-Pound units of measure on the design documents.

## 1.7 SPECIFICATIONS

Provide a Contractor-originated design specification that in conjunction with the drawings, demonstrates compliance with requirements of the RFP. The specified products, materials, systems, and equipment that are approved by the DOR; submitted to the Government by the Contractor; and reviewed by the Contracting Officer shall be used to construct the project. UFGS sections contained in RFP Part 2 shall become a part of the Contractor-originated Division 01 specification without modification. Specification Sections contained in RFP Part 5 shall become a part of the Contractor-originated specification without modification.

The specification coversheet shall be prepared and signed by the lead licensed architect or engineer of the project design team. Indicate the Contractor's company name and address on the specification coversheet of each design submittal.

### 1.7.1 Specifications Format

The use of UFGS sections are required. The Contractor shall prepare design specifications that include a UFGS specification for each product, material, or system on the project. Organize the specifications using Construction Specification Institute (CSI) Masterformat<sup>TM</sup>. A prescriptive

specification is required for all items. Provide project specifications to include the following:

- a. NAVFAC MIDLANT Specification Cover sheet with professional signature.
- b. SpecsIntact generated Table of Contents for entire specification.
- c. Individual UFGS specification sections for each product, material, and system required by the RFP. Edit UFGS sections in accordance with RFP requirements.
- d. SpecsIntact generated Coordinated Submittal Register for all products, materials and systems in the submittal.

#### 1.7.2 Specifications Section Source Priority

Choose UFGS Sections that describe the products, materials, and systems that are used on the project. Use current UFGS Sections that are available on the Whole Building Design Guide website and give priority to the UFGS sections that are prepared by NAVFAC. Only use UFGS sections prepared by other Agencies if an applicable NAVFAC prepared specification section does not exist. Whenever available and applicable to the project, UFGS specification sections created or edited to contain specific Marine Corps requirements shall be used. Pdf copies of these sections are contained in Part 6 Attachments. Source files for these sections will be provided upon request after contract award.

#### 1.7.3 Fire Protection Specifications

Specifications pertaining to spray-applied fire proofing and fire stopping, exterior fire alarm reporting systems, interior fire alarm and detection systems, and fire suppression systems, including fire pumps and standpipe systems shall be either prepared by, or reviewed and approved by the Fire Protection Designer of Record (DOR).

#### 1.7.4 Submittal Register

Submit a current submittal register with each design submittal. Provide a cumulative register that identifies the design and construction submittals required by each design package along with previous submittals. The DOR shall assist in developing the submittal register by determining which submittal items are required to be approved by the DOR. To obtain Government approval of the final design package, complete all fields in the submittal register.

The submittal register shall include all required documentation for Certification by the US Green Building Council (USGBC), such as the Measurement and Verification (M&V) plan as required for EA Credit 5.

#### 1.7.5 Specification Software

Create the project specification using SpecsIntact and submit the final Specification source files in SpecsIntact format. The electronic PDF file of the specifications shall be submitted in color.

### 1.8 DESIGN ANALYSIS

Prepare, organize, and present design analysis in accordance with the requirements of FC 1-300-09N. The design analysis shall be a presentation

of facts at the Concept Design Workshop to demonstrate the concept of the project is fully understood and the design is based on sound engineering principles. Provide design analyses for each discipline and include the following:

- a. Basis of design that includes:
  1. An introductory description of the project concepts that addresses the salient points of the design;
  2. An orderly and comprehensive documentation of criteria and rationale for system selection; and
  3. The identification of any necessary licenses and permits that are anticipated to be required as a part of the design and/or construction process. The "Permits Record of Decision" (PROD) form provided shall be used for recording permits.
- b. Code and criteria search shall identify all applicable codes and criteria and highlight specific requirements within these codes and criteria for critical issues in the facility design.
- c. Calculations as specified and as needed to support this design.
- d. Section titled "Sustainable Design" that addresses sustainable concepts and sustainability Rating Analysis Report prepared in accordance with specification section 01 33 29.05 20 SUSTAINABILITY REQUIREMENTS FOR DESIGN-BUILD.
- e. Draft and Final NAVFAC Sustainable and Energy Data Record Card (NSEDRC) that documents the energy usage and sustainable features of the building. Refer to Record Documents paragraphs in this section for requirements.
- f. Section titled "Antiterrorism" that documents the antiterrorism features.
- g. Fall Protection Analysis

#### 1.8.1 Basis of Design Format

The basis of design for each design discipline shall include a cover page indicating the project title and locations, contract number, table of contents, tabbed separations for quick reference, and bound in separate volumes for each design discipline.

#### 1.8.2 Design Calculations

Place the signature and seal of the designer responsible for the work on the cover page of the calculations for the respective design discipline.

#### 1.8.3 Sustainable Design

Integrate sustainable strategies and features into the design to minimize the energy consumption of the facilities; conserve resources; minimize adverse effects to the environment; and improve occupant productivity, health, and comfort to reduce the total cost ownership of the project using a whole building, life cycle approach. In accordance with the Engineering

and Construction Bulletin 2008-1 and other directives, the facility and all site features shall be designed and constructed in accordance with specification section 01 33 29.05 20 SUSTAINABILITY REQUIREMENTS FOR DESIGN-BUILD.

The minimum sustainable design rating level for the project is to achieve LEED GBDC Ref Guide Silver or GBI GP Compliance 2 globes. The design and construction shall incorporate sustainable design strategies and features to the fullest extent possible, consistent with mission, budget and client requirements. Ensure sustainable strategies and features in the design phase are incorporated in the construction phase.

Information and resources on sustainable design principles and guidelines are explained in the "Whole Building Design Guide" that can be found at [www.wbdg.org](http://www.wbdg.org).

#### 1.8.3.1 Third Party Certification (TPC) Documentation Submittals

Provide copies of the Third Party Certification Registration Application and the complete TPC support documentation submitted to the TPC Organization to obtain the minimum certificate level specified herein.

a. Provide the following information for the Basis of Design:

1. A completed TPC Checklist indicating all Sustainability Prerequisites and Credits to be implemented into the facility design and total TPC score for the project.
2. Description of how each TPC Prerequisite and Credit will be achieved.
3. List of Architects or Engineers from Contractor's Design Team and who on the team is responsible for implementing each TPC Prerequisite and Credit into the facility design.
4. Identify the Design Team's TPC Organization Accredited Professionals.

b. For the submission specified, provide the following:

1. At 35 percent Design submittal, provide documentation of the TPC Certification Registration Application.
2. At 100 percent Design submittal, provide a TPC Checklist preliminary documentation, in the form of a three-ring binder, of all TPC Prerequisites and Credits to be obtained as required by the TPC Organization Rating System.
3. At final design submittal, update the TPC Checklist and TPC documentation binder with any changes and include an electronic copy of the TPC documentation.
4. Within thirty (30) days of Beneficial Occupancy Date, develop and submit the project case study for the U.S. Department of Energy's Federal Energy Management Program "High Performance Federal Buildings Database" (<http://www.eere.energy.gov/femp/highperformance/>).
5. Within sixty (60) days after the beneficial Occupancy Date (BOD),

submit **Third Party Certification (TPC)** Registration Application and complete **TPC Certification Documentation** to **The TPC Organization** for certification. After **TPC** certification is obtained, provide the plaque and 5 color copies of the **TPC Certification** to the Contracting Officer. Mat and frame the original **TPC Certification** document.

#### 1.8.3.2 Low Impact Development (LID)

Provide a design that meets the LID requirements of the RFP.

Provide the following information in the Basis of Design. Update this information as applicable at each design submittal stage. This information is required by NAVFAC and must be entered into eProjects by the NAVFAC Midlant Civil Engineer:

- a. An itemized list of the LID features that will be provided.
- b. Estimated cost for each LID feature.
- c. Low Impact Development (LID) Reporting Form dated June 2012 located in PART 6 ATTACHMENTS.
- d. Percent Increase in Runoff.

#### 1.8.3.3 Sustainable Designer

The design team shall include at least one LEED Accredited Professional as recognized by U.S. Green Building Council. The LEED Accredited Professional shall have an active role in the design of the facility and be responsible for implementation and documentation of sustainable strategies and materials in the project.

#### 1.8.3.4 EPA Designated Products

Use products that meet or exceed the minimum requirements of this RFP and the EPA guideline standards for recovered content to the maximum practicable extent in the performance of the contract. See [www.epa.gov/cpg/products.htm](http://www.epa.gov/cpg/products.htm) for a list of EPA designated products and a list of manufacturers and suppliers of EPA designated products.

#### 1.8.4 Fall Protection Analysis

Eliminate fall hazards in the facility or if not feasible provide control measures to protect personnel conducting maintenance work after completion of the project. Identify fall hazards in the Basis of Design with the Design Development and Prefinal submittals. The analysis shall describe how fall hazards are considered, eliminated, prevented or controlled to prevent maintenance personnel from exposure to fall hazards while performing work at heights. Refer to RFP Part 2, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS for fall hazard protection requirements.

### 1.9 RECORD DOCUMENTS

#### 1.9.1 Record Drawings

The as-built modifications shall be accomplished by electronic drafting methods on the Contractor-originated.DWG design drawings to create a complete set of record drawings.

- a. For each record drawing, provide CADD drawing identical to signed Contractor-originated .PDF drawings, that incorporates modifications to the as-built conditions. In addition, copy initials and dates from the Contracting Officer approved .PDF documents to the title block of the record CADD.DWG drawings. The RFP reference or definitive drawings are not required for inclusion in the record set of drawings.
- b. After all as-built conditions are recorded on the CADD.DWG files, produce a PDF and.TIF file of each individual record drawing in conformance with FC 1-300-09N. Electronic signatures are not required on record drawings.
- c. Provide a searchable electronic copy of the photo documentation used in the QC Daily Reports. Refer to Section 01 45 00.05 20 DESIGN AND CONSTRUCTION QUALITY CONTROL.

#### 1.9.2 Source Documents

Provide the specifications, design analysis, reports, surveys, calculations, and any other contracted documents on the CD-ROM disk with the record drawings.

#### 1.9.3 NAVFAC Sustainable and Energy Data Record Card

Submit the NAVFAC Sustainable and Energy Data Record Card (NSEDRC) to document the energy usage and sustainable features of the facility. Follow the instructions provided and fill in the blank editable Adobe .PDF form available on the Whole Building Design Guide at the following web address: [http://www.wbdg.org/references/pa\\_dod\\_sust\\_contract.php](http://www.wbdg.org/references/pa_dod_sust_contract.php) . Prepare the following submissions;

- a. Draft submission. As a part of the Final Design submission the DOR shall complete the NSEDRC and include it as part of the Design Analysis and submit to the Contracting Officer for approval.
- b. Final Submission. The Contractor and Designer of Record shall complete the electronic file documenting the NSEDRC with final data and provide the Final Submission 60 days prior to the Beneficial Occupancy Date (BOD) of the facility. The Final submission shall update the Draft submission information. Submit to the Contracting Officer for approval.

#### 1.9.4 GEOSPATIAL INFORMATION SYSTEMS (GIS) DELIVERABLES

Provide geospatial data and documents for all features added, demolished or modified as part of this project in accordance with Section 01 78 30.00 22 DIGITAL DATA DELIVERABLES (GIS).

#### 1.10 REAL PROPERTY RECORD

DD Form 1354 "Transfer and Acceptance of Military Real Property" is utilized to record and maintain the Base's real property inventory and to manage capital improvements costs.

A Draft DD Form 1354 is attached to this section. Note: The Draft DD Form 1354 will not contain cost or quantity information. The Contractor shall provide this information based on "as constructed" conditions.

The DOR shall provide an Updated Draft DD Form 1354 with each prefinal and

final design submittal. Each Updated Draft DD Form 1354 shall incorporate revisions as required based on review comments and the project design. Projected "as constructed" Contractor data including units of measure, quantities, costs, etc. should be added as it becomes available. Data shall be revised to reflect "as constructed" conditions as the project proceeds to completion.

The DD Form 1354 shall be prepared in accordance with [UFC 1-300-08](#), available at [http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4).

Near the completion of the project, but a minimum of 60 days prior to the projected Beneficial Occupancy Date (BOD), update the Draft DD Form 1354 and submit a [Preliminary Interim DD Form 1354](#), accounting for all installed property. Required data will include costs, quantities, units of measure, etc. as indicated on the DD Form 1354. Include any additional assets/improvements/alterations from the Draft DD Form 1354. An Excel version of this document can be provided by the Government for use in providing this data. Contact the Contracting Officer for any project specific information necessary to complete the DD Form 1354.

Submit an [Updated Interim DD Form 1354](#) for approval with the Final Invoice. The Updated Interim DD Form 1354 shall address all requested revisions to the Preliminary Interim DD Form 1354 and shall be updated to contain Contractor's "Final" quantity and cost information.

The Final DD Form 1354 will be prepared by the Activity Real Property Accountability Officer (RPAO) at final project closeout after all outstanding issues have been resolved. The Final DD Form 1354 will be prepared using the Contractor provided project data.

## PART 2 PRODUCTS

### 2.1 CONSOLIDATED RFP DOCUMENTS

Within **four weeks** after contract award, provide three electronic and hard copies of a consolidated RFP documents incorporating the Contractor's Proposal and all RFP amendments and revisions that are contained in the contract award. Identify the changes to the RFP with the "Red-Lining" or "Track Changes" feature of SpecsIntact or MS Word to highlight the pre-award modifications to the contract. Identify the amendment source at each addition and deletion by annotation, such as footnote or reference in parenthesis.

Submit the specification with the "Redlining/Change" indicated at the Prefinal (100%) submittal; submit the specifications with the changes incorporated, without redlines showing at the Final Design Submittal. The electronic PDF file of the specification shall be submitted in color.

### 2.2 DESIGN SUBMITTALS

Complete the Contractor-originated design submittals as defined by this contract, and coordinate with the approved design network analysis schedule.

#### 2.2.1 Design Submittal Packages

The Government prefers to review for Quality Assurance (QA) as few submittal packages as possible. Site and Building Design Submittal Packages are required, however Early Start Design Submittals are acceptable if they are substantiated as having an impact to the critical path in the



Government approved Network Analysis Schedule. An Early Start submittal shall include all design analyses, drawings, specifications and product data required to fully describe the project element for Government review.

Upon acceptable resolution of Government QA comments for Final Early Start submittals, the Early Start Design will be released to the Contractor for construction. Release of Early Start submittals does not imply final government approval of the design. Upon acceptable resolution of Government QA comments for all Final Design submittals, the entire design package will be released to the Contractor for construction. The Contractor is responsible for coordinating all design submittals, and is responsible for any changes that may occur between the Final Early Start acceptance and Final Design.

The Site Design may be submitted as an Early Design Submittal Package and shall include the following components:

- a. Master Site Plan
- b. Demolition Plan
- c. Geotechnical
- d. Site Work including Environmental, water, sewer, storm drainage, erosion and sediment control, and electrical and mechanical utilities.

The remaining elements, including foundations, structural systems, building enclosures, interior electrical and mechanical systems, remaining work and furniture/equipment (as applicable) shall be provided in the Building Design Submittal Package.

#### 2.2.2 Required Design Submittals

Provide the following Design Submittal packages. Provide comprehensive, multi-discipline design packages that include design documentation for project elements, fully developed to the design stage indicated, and in accordance with FC 1-300-09N, except where specified otherwise.

- a. Concept Design presented at Concept Design Workshop approximately 20% to 30% design.
- b. Early Start Design (approximately 70% to 90% design, provide red-lined specifications) and Building Design Development (35%-50% design) - Government QA. 21 calendar day Government review time.
- c. Final Site Design (include final specifications) and Prefinal Building Design (provide red-lined specifications)- Government QA. 21 calendar day Government review time.
- d. Final Building Design (Complete, ready for Construction. Provide specifications with changes incorporated). - 14 calendar day Government review time. Government QA

#### 2.2.3 Design Submittal Review Schedule

Use the time frames for Government submittal review identified in the RFP. For construction scheduling purposes add additional time to the identified minimum review time periods to allow for the following scheduling conditions;

- a. Submittals received after noon will be logged in on the following business day.
- b. Federal holidays will be considered non-working days for Government personnel in reviewing design submittals.
- c. The time period between December 21 and January 4 will be considered non-working time for Government personnel in reviewing design submittals.
- d. Postponement of delivery due to unavailability of personnel to receive the submittal or heightened security at Base. Coordinate delivery in advance of the submission.

#### 2.2.4 Review Copies of Design Submittal Packages

- a. Provide copies of each design submittal package for review to the following reviewers. Paper copies of the design drawings shall be half size (11" X 17"). Addresses for mailing will be furnished at the PAK meeting.
  1. 9 paper copies of half-size (11" X 17") design drawings only plus 3 CD copies of the complete submittal to the NAVFAC component:  
  
(Insert project manager name here), Code OPQC15, Marine Corps IPT  
9742 Maryland Avenue  
Norfolk, Virginia 23511-3095
  2. 4 paper copies plus 2 CD copies to the Resident Officer in Charge of Construction.
  3. 5 copies plus 2 CD copies to the Activity POC (IDD) (2 copies plus 1 CD copy for final design submittal.)
  4. 1 paper copy plus 1 CD copy to:  
  
SPAWAR Charleston: (35% to 100% plans)  
Commanding Officer  
Space and Naval Warfare Systems Center Charleston  
ATTN: Code 74M/Steven Leya  
P.O. Box 190022  
North Charleston, SC 29419-9022  
(843) 218-4490
- b. Provide the same quantities of copies for resubmittals, as required for each design submittal.

#### 2.3 IDENTIFICATION OF DESIGN SUBMITTALS

Provide a title sheet to clearly identify each submittal, the completion status, and the date. The title sheet shall use the standard format indicated in the FC 1-300-09N for title sheets. The title sheet shall be unique to a particular design submittal. Submit the project title sheet with design status and date for the design submittals.

##### 2.3.1 Early Start Submittal Title Sheet

Identify Early Start submittals as such, and include a title sheet

indicating the type of Early Start submittal, the status, and the date.

### PART 3 EXECUTION

#### 3.1 3.1 MCB CAMP LEJEUNE ARCHITECTURAL REVIEW BOARD

In conjunction with the Concept Design presented at Concept Design Workshop, the Contractor shall schedule and meet with the MCB Camp Lejeune Architectural Review Board in compliance with Section 6.0 of the MCBCL BEAP.

#### 3.2 CONTRACTOR'S RESOLUTION OF COMMENTS

Provide written responses to all written comments by the Government. Resubmittal of an unacceptable design submittal shall be a complete package that includes all the required, specified components of that design submittal. **Government required resubmittal due to nonconformance to the contract is not a delay in the contract.**

#### 3.3 DESIGN CHANGE AND VARIATIONS

Refer to **Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES** for further explanation and requirements of design change and variation. Design changes that the Contractor considers to be beyond the requirements of the **contract must** be identified as a design change during the early stages of the facilities design **development**. All design changes that will lead to an extra cost or schedule extension must be identified prior to the first design submittal that includes the design change. Design changes that lead to extra cost or schedule extension identified after the first design submittal review will not be considered.

#### 3.4 THE CONTRACT AND ORDER OF PRECEDENCE

##### 3.4.1 Contract Components

The contract consists of the solicitation, the approved proposal, and the final design.

##### 3.4.2 Order of Precedence

NFAS Clause 5252.236-9312. In the event of a conflict or inconsistency between any of the below described portions of the conformed contract, precedence shall be given in the following order:

- a. Any portions of the proposal or final design that exceed the requirements of the solicitation.
  1. Any portion of the approved proposal that exceeds the final design.
  2. Any portion of the final design that exceeds the proposal.
  3. Where portions within either the proposal or the final design conflict, the portion that most exceeds the requirements of the solicitation has precedence.
- b. The requirements of the solicitation, in descending order of precedence:
  1. Standard Form 1442, Price Schedule, and Davis Bacon Wage Rates.
  2. Part 1 - Contract Clauses.

3. Part 2 - General Requirements.
4. Part 3 - Project Program Requirements.
5. Part 6 - Attachments (excluding Concept Drawings).
6. Part 5 - Prescriptive Specifications exclusive of performance specifications.
7. Part 4 - Performance Specifications exclusive of prescriptive specifications.
8. Part 6 - Attachments (Concept Drawings).

#### 3.4.2.1 Government Review or Approval

Government review or approval of any portion of the proposal or final design shall not relieve the Contractor from responsibility for errors or omissions with respect thereto.

-- End of Section --

SUBMITTAL REGISTER												CONTRACT NO.					
TITLE AND LOCATION SIMULATOR CENTER & RANGE CONTROL FACILITIES						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION OR REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/  DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/  DATE RCD FRM APPR AUTH	REMARKS
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		01 14 00.05 20	SD-01 Preconstruction Submittals														
			List of contact personnel	1.3.1.1	G												
		01 20 00.05 20	SD-01 Preconstruction Submittals														
			EARNED VALUE REPORT	1.3	G												
		01 30 01.00 22	SD-02 Shop Drawings														
			Preliminary (Pre-Final) FF&E	1.4.4													
			Package														
			Final FF&E Package	1.4.8	G												
			Best Value Determinations	1.3.3	G												
			Audio Visual (A/V) Package	1.3.3	G												
			SD-11 Closeout Submittals														
			Interior Photography	3.6													
		01 31 19.05 20	SD-01 Preconstruction Submittals														
			Project Schedule	1.7	G												
			Performance Assessment Plan	1.6	G												
			(PAP)														
			CDW Facilitator Experience	1.5.2.1	G												
			Resume														
			CDW Preliminary Concept	1.5.3.1	G												
			Design														
			CDW Basis of Design with Cost	1.5.3.2	G												
			Estimate														
			CDW Concept Design Report	1.5.2.4	G												
		01 32 17.05 20	SD-01 Preconstruction Submittals														
			Qualifications	1.5	G												

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		01 32 17.05 20	Design Baseline Network Analysis Schedule (NAS)	1.3	G												
			Construction Baseline Network Analysis Schedule (NAS)	1.3	G												
			SD-07 Certificates														
			Monthly Network Analysis Schedule Updates	1.7.1	G												
			Three-Week Look Ahead Schedule	1.10	G												
			SD-11 Closeout Submittals														
			As-Built Schedule	1.7.2	G												
		01 33 00.05 20	SD-01 Preconstruction Submittals														
			Submittal Register Format	1.3.1	G												
			Submittal Register	1.4.7	G												
		01 33 10.05 20	SD-01 Preconstruction Submittals														
			Consolidated RFP Documents	2.1	G												
			Submittal Register	1.7.4	G												
			SD-05 Design Data														
			Design Drawings	1.6	G												
			Specifications	1.7	G												
			Design Analysis	1.8	G												
			Updated Draft DD Form 1354	1.10	G												
			Design Submittals	2.2	G												
			Sustainable Design	1.8	G												
			SD-07 Certificates														

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		01 33 10.05 20	Third Party Certification (TPC) Documentation	1.8.3.1	G												
			Third Party Certification Registration Application	1.8.3.1	G												
			TPC Certification	1.8.3.1	G												
			SD-11 Closeout Submittals														
			Record Documents	1.9	G												
			NAVFAC Sustainable and Energy Data Record Card	1.9.3	G												
			Preliminary Interim DD Form 1354	1.10	G												
			Updated Interim DD Form 1354	1.10	G												
		01 33 29.05 20	SD-01 Preconstruction Submittals														
			Preliminary Sustainability Notebook Submittal	1.5.1.1	G												
			Preliminary High Performance and Sustainable Building Checklist	1.5.2	G												
			SD-05 Design Data														
			Final Design Sustainability Notebook Submittal	1.5.1.1	G												
			Final Design High Performance and Sustainable Building Checklist	1.5.2	G												
			SD-11 Closeout Submittals														
			Final Sustainability Notebook Submittal	1.5.1.1	G												

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		01 33 29.05 20	Final High Performance and Sustainable Building Checklist	1.5.2	G												
			Third Party Certification Plaque and Certificates	3.2.1	G												
		01 33 29	SD-01 Preconstruction Submittals														
			Preliminary Sustainability Notebook	1.5.2.1	G												
			Preliminary High Performance and Sustainable Building Checklist	1.5.2.1													
			SD-07 Certificates														
			Third Party Certification (TPC)	1.4.4													
			SD-11 Closeout Submittals														
			Final Sustainability Notebook	1.5.2.1	G												
			Final High Performance and Sustainable Building Checklist	1.5.2.1	G												
			Amended Final Sustainability Notebook	1.5.2.1	G												
			Third Party Certification Plaque and Certificates	3.2.1	G												
		01 35 26	SD-01 Preconstruction Submittals														
			Accident Prevention Plan (APP)	1.7	G A												
			Activity Hazard Analysis (AHA)	1.8	G A												
			Crane Critical Lift Plan	1.7.1	G A												
			Crane Operators	1.6.1.3	G A												
			Traffic Control Plan	1.17.1	G A												
			Standard Hand Signals	1.17.2.1	G A												



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		01 35 26	SD-06 Test Reports														
			Notifications and Reports	1.12													
			Accident Reports	1.12.2													
			Crane Reports	1.12.3													
			Arc Flash Risk/Hazard Analysis	3.8.2	G												
			SD-07 Certificates														
			Confined Space Entry Permit	1.9													
			Hot work permit	1.9													
			Arc Flash Risk/Hazard Analysis	3.8.3	G												
			Qualifications														
			Contractor Electrical Energized	3.8.4	G												
			Work Permit														
			Contractor Safety Self-Evaluation	1.4	G A												
			Checklist														
			Certificate of Compliance	1.12.4													
		01 45 00.05 20	SD-01 Preconstruction Submittals														
			Design Quality Control (DQC)	1.3.3	G												
			Plan														
			Construction Quality Control	1.3.3	G												
			(CQC) Plan														
			SD-05 Design Data														
			Design Quality Control	1.4.2	G												
			Documentation														
			SD-06 Test Reports														
			Acceptance Testing of Critical														
			Systems Checklist														

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		01 45 00.05 20	SD-07 Certificates														
			Preliminary Inspections and Final Acceptance Testing	1.4.3.1	G												
			Final Life Safety/Fire Protection Certification	1.4.3.1	G												
			ICC IBC Special Inspections Certification	1.4.3.2	G												
			ICC IBC Special Inspections Certification	1.4.3.3	G												
			ICC IBC Special Inspections Certification	1.4.3.4	G												
			ICC IBC Special Inspections Certification	1.4.3.5	G												
			ICC IBC Special Inspections Certification	1.4.3.6	G												
			SD-11 Closeout Submittals														
			Summary Commissioning Report														
		01 50 00.05 20	SD-01 Preconstruction Submittals														
			Traffic control plan	1.8.1	G												
			SD-06 Test Reports														
			Backflow Preventer Tests	3.3	G												
			SD-07 Certificates														
			Backflow Tester	1.6	G												
			Backflow Preventers	1.4													
		01 57 19.00 20	SD-01 Preconstruction Submittals														
			Preconstruction Survey	1.5.1	G												

SUBMITTAL REGISTER											CONTRACT NO.						
TITLE AND LOCATION SIMULATOR CENTER & RANGE CONTROL FACILITIES						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT OR CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 19.00 20	Solid Waste Management Plan and Permit	3.4	G												
			Regulatory Notifications	1.5.2	G												
			Environmental Management Plan	3.1	G												
			Storm Water Pollution Prevention Plan	3.2.2.1	G												
			Air Emissions Source Specification Data	3.2.5	G												
			Dirt and Dust Control Plan	3.14.1													
			Contractor Hazardous Material Inventory Log	3.6	G												
			SD-06 Test Reports														
			Laboratory Analysis	3.13.2.2													
			Disposal Requirements	3.15.2													
			Erosion and Sediment Control Inspection Reports	3.2.2													
			Storm Water Inspection Reports for General Permit	3.2.2													
			Contractor 40 CFR employee training records	1.5.5													
			Solid Waste Management Report	3.4.1	G												
			SD-11 Closeout Submittals														
			Storm Water Pollution Prevention Plan compliance notebook	3.2.2.2	G												
			Waste Determination Documentation	3.5													

SUBMITTAL REGISTER											CONTRACT NO.						
TITLE AND LOCATION SIMULATOR CENTER & RANGE CONTROL FACILITIES						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT OR CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 19.00 20	Disposal Documentation for Hazardous and Regulated Waste	3.6.1													
			Contractor 40 CFR Employee Training Records	1.5.5													
			Solid Waste Management Permit	3.4													
			Solid Waste Management Report	3.4.1													
			Contractor Hazardous Material Inventory Log	3.6	G												
			Hazardous Waste/Debris Management	3.13.2													
			Regulatory Notifications	1.5.2													
		01 60 00.00 22	SD-07 Certificates														
			Certificate of North Carolina Licensed Applicator	1.2.1	G												
			SD-11 Closeout Submittals														
			Field Pesticide/Herbicide Management Record Form	3.2	G												
		01 78 24.00 20	SD-07 Certificates														
			Qualifications of eOMSI Preparer	1.6	G												
			Qualifications of eOMSI Preparer	1.6	G												
			SD-10 Operation and Maintenance Data														
			Training Plan	3.1.1	G												
			Training Plan	3.1.1	G												
			Training Plan	3.1.1	G												
			Training Outline	3.1.3	G												

CONTRACT NO.

### TITLE AND LOCATION

CONTRACTOR

## SIMULATOR CENTER & RANGE CONTROL FACILITIES

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TITLE: SIMULATOR CENTER AND RANGE CONTROL BUILDING, MCB CAMP LEJEUNE, NC (16P1346)

TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY											Form Approved OMB No. 0704-0188				
PAGE 1 OF 3 PAGES															
The public reporting burden for the collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.															
PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE ABOVE ORGANIZATION															
1. FROM (Installation/Activity/District and ZIP Code)				2. DATE PREPARED (YYYYMMDD)  20150424		3. PROJECT/JOB NUMBER  16P1346		4. SERIAL NUMBER		8. TRANSACTION DETAILS					
5. TO (Installation/Activity/Service, ZIP Code & INSNO) COMMANDING GENERAL ATTN: PUBLIC WORKS DIVISION MARINE CORPS BASE PSC BOX 20004 CAMP LEJEUNE, NC 28542-0004				6. SITE/INSNO/ NAME  M67001		7. CONTRACT NUMBER(S)		7a. PLACED-IN- SERVICE DATE (YYYYMMDD)		a. <input checked="" type="checkbox"/> NEW CONST. <input type="checkbox"/> EXISTING FAC. <input type="checkbox"/> CAPITAL IMP. <input type="checkbox"/> OTHER (Specify)			b. <input type="checkbox"/> PHYS. COM. AVAIL. <input type="checkbox"/> RFNF/O <input type="checkbox"/> PARTIAL BOD <input type="checkbox"/> FINANCIAL COM. <input type="checkbox"/> OTHER (Specify)		
										c. <input checked="" type="checkbox"/> DRAFT <input type="checkbox"/> FINAL <input type="checkbox"/> INTERIM			d. EFFECTIVE DATE (YYYYMMDD)		
9. ITEM NO.	10a. FACILITY NO.	10b. RPUID	11. CATEGORY CODE	12. CATCODE DESCRIPTION	13. TYPE CODE	AREA		OTHER		18. COST	19. FUND SOURCE	20. FUND ORG	21. INTER- EST CODE	22. ITEM REMARKS	
14. UNIT OF MEAS 1	15. TOTAL QUANTITY UM 1	16. UNIT OF MEAS 2	17. TOTAL QUANTITY UM2												
1			13117	TELECOMMUNICATIONS CENTER											
2			13510	COMMUNICATION-LINES - OTHER THAN TELEPHONE											
3			13520	TELEPHONE LINES											
4			81220	STREET LIGHTING											
5															
6															
7															
23a. TRANSFERRED BY (Typed Name and Signature)						23b. DATE SIGNED (YYYYMMDD)		24a. ACCEPTED BY (Typed Name and Signature)						24b. DATE SIGNED (YYYYMMDD)	
23c. TITLE (Area Engr./Base Engr./DPW)								24c. TITLE (DPW/RPAO)						25. PROPERTY VOUCHER NUMBER	





**TITLE: SIMULATOR CENTER AND RANGE CONTROL BUILDING, MCB CAMP LEJEUNE, NC (16P1346)**

						AREA		OTHER						
9. ITEM NO.	10a. FACILITY NO.	10b. RPUID	11. CATEGORY CODE	12. CATCODE DESCRIPTION	13. TYPE CODE	14. UNIT OF MEAS 1	15. TOTAL QUANTITY UM 1	16. UNIT OF MEAS 2	17. TOTAL QUANTITY UM2	18. COST	19. FUND SOURCE	20. FUND ORG	21. INTER- EST CODE	22. ITEM REMARKS
8			81231	OVERHEAD ELECTRICAL DISTRIBUTION LINES										
9			81232	UNDERGROUND ELECTRICAL DISTRIBUTION LINES										
10			81240	AREA LIGHTING										
11			83210	SANITARY SEWER										
12			84120	WATER SUPPLY MAINS										
13			84210	WATER DISTRIBUTION POTABLE BASE										
14			84310	FIRE PROTECTION WATER DISTRIBUTION										
15			84450	STORMWATER POND										
16			85210	PARKING AREA										
17			85220	SIDEWALK										
18			87110	STORM SEWER										
19			88010	FIRE-ALARM SYSTEM										
20			93310	DEMOLITION										
21														
22														
23														

**TYPICAL SUPPORT FACILITY NUMBERS AND CATEGORY CODES**

					AREA		OTHER						
10. ITEM NO.	11. FACILITY NO.	12. CATEGORY CODE	13. CATCODE DESCRIPTION	14. TYPE	15. UNIT OF MEAS 1	16. TOTAL QUANTITY UM 1	17. UNIT OF MEAS 2	18. TOTAL QUANTITY UM2	19. COST	20. FUND SOURCE	21. FUND ORG	22. INTER- EST CODE	23. ITEM REMARKS
24	UN660	81231	OVERHEAD ELECTRICAL DISTRIBUTION LINES				LF						
25		81232	UNDERGROUND ELECTRICAL DISTRIBUTION LINES				LF						
26	UN240	83210	SANITARY SEWER BASE				LF						
27	UN241	83210	SANITARY SEWER (H)				LF						
28	UN910	84210	WATER DISTRIBUTION POTABLE BASE				LF						
29	UN246	84120	SUPPLY MAINS		LF		GM						
30	UN1043	84120	WATER DISTRIBUTION POTABLE (H)				LF						
31	UN1387	84310	FIRE PROTECTION PIPELINE				LF						
32	UN1142	84520	NON POTABLE WATER LINE				LF						
33	UN640	13520	TELEPHONE LINES BASE				MI						
34	UN1275	81220	STREET LIGHTING		LF		EA						
35	UN890	83120	OUTFALL SEWER LINE		LF		KG						
36	UN1081	83240	INDUSTRIAL WASTE SEWER LINES				LF						

**TYPICAL SUPPORT FACILITY NUMBERS AND CATEGORY CODES**

10. ITEM NO.	11. FACILITY NO.	12. CATEGORY CODE	13. CATCODE DESCRIPTION	14. TYPE	AREA		OTHER		19. COST	20. FUND SOURCE	21. FUND ORG	22. INTER- EST CODE	23. ITEM REMARKS
					15. UNIT OF MEAS 1	16. TOTAL QUANTITY UM 1	17. UNIT OF MEAS 2	18. TOTAL QUANTITY UM2					
37	UN1045	85110	ROADS/BIT (H) - Hosp Pt		SY		MI						
38	UN270	85110	ROADS/CONCRETE		SY		MI						
39	UN280	85110	ROADS/BIT		SY		MI						
40	UN1053	85110	ROADS/SHELLROCK		SY		MI						
41	UN287	85110	ROADS/DIRT CAMP DAVIS		SY		MI						
42	UN290	85110	ROADS/SHELLROCK		SY		MI						
43	UN300	85110	ROADS/DIRT CAMP DAVIS		SY		MI						
44	UN1044	85210	PARKING AREA/BIT (H)		SY								
45	UN340	85210	PARKING AREA/CONC		SY								
46	UN350	85210	PARKING AREA/BIT		SY								
47	UN360	85210	PARKING AREA/SHELLROCK		SY								
48	UN370	85210	PARKING AREA/DIRT		SY								
49	UN1038	85220	SIDEWALKS/CONC (H)		SY								
50	UN1102	85220	SIDEWALK/BRICK (BEIRUT MEM)		SY								
51	UN380	85220	SIDEWALK/CEMENT		SY								
52	UN390	85220	SIDEWALK/BIT		SY								

## TYPICAL SUPPORT FACILITY NUMBERS AND CATEGORY CODES

10. ITEM NO.	11. FACILITY NO.	12. CATEGORY CODE	13. CATCODE DESCRIPTION	14. TYPE	15. UNIT OF MEAS 1	16. TOTAL QUANTITY UM 1	17. UNIT OF MEAS 2	18. TOTAL QUANTITY UM2	19. COST	20. FUND SOURCE	21. FUND ORG	22. INTER-EST CODE	23. ITEM REMARKS
53	UN400	85220	SIDEWALK/SHELLROCK		SY								
54	UN1401	85235	OTHER PAVED AREA (GEIGER)		SY								
55	UN470	87110	STORM SEWERS		LF								
56	UN1274	87110	STORM SEWERS (H)		LF								
57	UN480	87120	DRAINAGE DITCH				LF						
58	UN1047	87210	SECURITY FENCE/WALL (H)				LF						
59	UN500	87210	SECURITY FENCE/WALL				LF						
60	UN570	87215	INTERIOR FENCING				LF						
61	UN1108	84210	WATER DISTRIBUTION LINES BEIRUT MEM				LF						
62	UN680	81240	PERIMETER/SECURITY FENCING		LF		EA						
63		84450	POND		MG								Contact David Balog, EMD, for SWP #
64	UN1387	84310	FIRE PROTECTION PIPELINE		LF								
65		83230	GRINDER PUMP STATION		GM		EA						
66		83116	OIL/WATER SEPARATOR/GRIT CHAMBER		KG								
67	SRELEC	81231	OVERHD/ELECT DIST LN SANDY RUN		LF								
		81232	UNDRGR/ELECT DIST LN SANDY RUN		LF								
68	SRFENC	87215	INTERIOR FENCE SANDY RUN		LF								
69	SRPARKC	85210	PARKING CONCRETE SANDY RUN		EA								
70	SRROADB	85110	ROADS, BIT SANDY RUN		SY		MI						
71	SRROADC	85110	ROADS, CONCRETE SANDY RUN		SY		MI						
72	SRROADS	85111	ROADS, SHELLROCK SANDY RUN		SY		MI						

## TYPICAL SUPPORT FACILITY NUMBERS AND CATEGORY CODES

10. ITEM NO.	11. FACILITY NO.	12. CATEGORY CODE	13. CATCODE DESCRIPTION	14. TYPE	15. UNIT OF MEAS 1	16. TOTAL QUANTITY UM 1	17. UNIT OF MEAS 2	18. TOTAL QUANTITY UM2	19. COST	20. FUND SOURCE	21. FUND ORG	22. INTER- EST CODE	23. ITEM REMARKS
73	SRSEWER	83210	SEWER SANITARY SANDY RUN		LF								
74	SRSTORM	87110	STORM SEWER SANDY RUN		LF								
75	SRTTEL	13520	TELEPHONE LINES SANDY RUN		MI								
76	SRWTRP	84210	WTR/DIS LN POT SANDY RUN		LF								
77	OGELECT	81231	OVERHD/ELECT DIST LN OAK GROVE		LF								
		81232	UNDRGR/ELECT DIST LN OAK GROVE		LF								
78	OGMAT	11320	ACFT PARKING OAK GROVE		SY								
79	OGRDBIT	85110	ROADS, BIT OAK GROVE		SY		MI						
80	OGRTA	17420	OAK GROVE TRAINING AREA (111)		AC								
81	OGRW523	11115	RUNWAY 5-23 OAK GROVE		SY		LF						
82	OGRW927	11115	RUNWAY 9-27 OAK GROVE		SY		LF						
83	OGWATER	84210	WTR DIST LN POT OAK GROVE		LF								
84	ORW1838	11115	RUNWAY 18-38 OAK GROVE		SY		LF						

PAGE      OF      PAGES

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## DD Form 1354 Addendum

### CLASS 2 PROPERTY RECORD DATA

ACTIVITY UIC: \_\_\_\_\_ DD Form 1354, Item 6

ACTIVITY NAME: \_\_\_\_\_ DD Form 1354, Item 5

SPEC AREA \_\_\_\_\_

PR NO \_\_\_\_\_

FACILITY NO: \_\_\_\_\_ DD Form 1354, Item 11

### LOCATION GENERAL INFO

COUNTRY: iNFADS fills this based on UIC and Special Area

RPTG-CLMT-UIC \_\_\_\_\_

ACTION TYPE \_\_\_\_\_ (Acquisition, Capital Improvement, Disposal)

STATE: iNFADS fills this based on UIC and Special Area

COUNTY: iNFADS fills this based on UIC and Special Area

CITY: iNFADS fills this based on UIC and Special Area

FACILITY NAME: \_\_\_\_\_ Completed by gaining installation

MAP GRID: \_\_\_\_\_ Completed by gaining installation

FORMER ACTIVITY UIC: \_\_\_\_\_ DD Form 1354, Item 1, Transfer only

FORMER PR NO.: \_\_\_\_\_ Transfers within Dept of Navy only

FACILITY TYPE: \_\_\_\_\_ Determined by Prime Use Category Code

FAMILY HOUSING INDICATOR: \_\_\_\_\_ Y/N

### MEASUREMENTS

LENGTH \_\_\_\_\_

WIDTH \_\_\_\_\_

HEIGHT \_\_\_\_\_

DEPTH \_\_\_\_\_

AREA/UM \_\_\_\_\_

STORIES \_\_\_\_\_

IRREGULAR \_\_\_\_\_ (Y or N)

ATTIC \_\_\_\_\_ (Y or N)

BASEMENT \_\_\_\_\_ (Y or N)

MEZZANINE \_\_\_\_\_ (Y or N)

PENTHOUSE \_\_\_\_\_ (Y or N)

### CONSTRUCTION

YEAR BUILT \_\_\_\_\_ (New Construction)

YEAR IMPROVED \_\_\_\_\_ (Capital Improvement)

CURR PROJ NO \_\_\_\_\_ (Capital Improvement)

## DD Form 1354 Addendum

ORIG PROJ NO \_\_\_\_\_ (New Construction)

CONSTRUCTION TYPE \_\_\_\_\_ (P, S, T, or R)

HERITAGE ASSET DATA – \_\_\_\_\_ Transfers only

### MAINTENANCE

PRIME USE CAT CODE \_\_\_\_\_ (Largest Category Code for facility on DD Form 1354, Item 12)

MAINT FUND CODE \_\_\_\_\_ (Supplied by gaining installation)

MAINT RESP \_\_\_\_\_ (Supplied by gaining installation)

COST REF DOCUMENT NUMBERS: \_\_\_\_\_ DD Form 1354, Item 7

### EXCESS / DISPOSAL (DISPOSAL DD FORM 1354 ONLY)

EXCESS ACTION CODE \_\_\_\_\_

EXCESS ACTION DATE \_\_\_\_\_

DISPOSAL METHOD \_\_\_\_\_

DISPOSAL DATE \_\_\_\_\_

EFD DISPOSAL CONTRACT \_\_\_\_\_

GSA DISPOSAL CONTRACT \_\_\_\_\_

DISP CONSOL PR \_\_\_\_\_

### STATUS / UTILIZATION

USER UIC/OG ID \_\_\_\_\_ (Supplied by gaining installation)

CATEGORY CODE \_\_\_\_\_ DD Form 1354, Item 12

USE \_\_\_\_\_ ( Optional)

AREA/UM \_\_\_\_\_ DD Form 1354, Items 15 and 16

OTHER/UM \_\_\_\_\_ DD Form 1354, Items 17 and 18

ALT/UM \_\_\_\_\_ Must be put in Remarks section of DD Form 1354, where applicable.



SECTION 01 33 29.05 20

SUSTAINABILITY REQUIREMENTS FOR DESIGN-BUILD

09/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING  
ENGINEERS (ASHRAE)

ASHRAE 55 (2010; Errata 2011; Addenda A 2011; Addenda B, C, D, E and F 2012; Errata 2012; Addenda G, H, I, J, K, L, M, N, O, P, Q and R ) Thermal Environmental Conditions for Human Occupancy

ASHRAE 62.1 (2010; Errata 2011; INT 3 2012; INT 4 2012; INT 5 2013) Ventilation for Acceptable Indoor Air Quality

ASHRAE 90.1 - IP (2010; Errata 1-4 2011; INT 1-12 2011; Addenda A, B, C, G, H, J, K, O, P, S, Y, Z, BZ, CG, CI and DS 2012; Errata 5-9 2012; INT 13-16 2012; Errata 10-12 2013; INT 17-18 2013) Energy Standard for Buildings Except Low-Rise Residential Buildings

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N (2014) Navy and Marine Corps Design Procedures

UFC 1-200-02 (2013) High Performance and Sustainable Building Requirements

U.S. DEPARTMENT OF DEFENSE (DOD) UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-210-10 (2010) Low Impact Development

GREEN BUILDING INITIATIVE (GBI)

GBI GP Compliance GBI Guiding Principles Compliance Program for New Construction

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION  
(SMACNA)

ANSI/SMACNA 008 (2007) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition

U.S. DEPARTMENT OF ENERGY (DOE)

Federal Guiding Principles (2008) High Performance and Sustainable  
Buildings Guidance

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC Ref Guide (2009; R 2010) LEED Reference Guide for  
Green Building Design, Construction and  
Major Renovations of Commercial and  
Institutional Buildings including Core &  
Shell and K-12 Projects

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247 Comprehensive Procurement Guideline for  
Products Containing Recovered Materials

U.S. DEPARTMENT OF AGRICULTURE (USDA)

USDA BiopREFERRED Program United States Department of Agriculture's  
BiopREFERRED Program

1.2 SUMMARY

This specification includes general requirements and procedures for projects to be designed, constructed, and documented per the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements (if applicable), and other requirements identified in this specification.

1.3 SUBMITTALS

Submittals requirements are specified in the technical sections using Submittal Description (SD) numbers and titles. Submittals requiring Government approval use a "G" or submittal designator in the UFGS sections. In addition, submit the GPV and TPC-required sustainability documentation in this specification as "S" submittals. Submittals not having a "G" designation are for Contractor Quality Control approval.

Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with the requirements of this Section.

Government approval is required for submittals in RFP Part 2 with a "G" designation. Additional construction submittals reserved for Government approval are listed in the Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES. Submittals with a "G" designation found in the sections used by the Contractor to create construction specification, require DOR approval. DOR approved submittals are also listed in the "Construction Submittals" paragraph in each RFP PART 4, Performance Technical Specifications. Provide required certification or validation submittals in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES, Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES, FC 1-300-09N, Design Procedures, and as identified below.

SD-01 Preconstruction Submittals

Preliminary Sustainability Notebook Submittal; G

Preliminary High Performance and Sustainable Building Checklist; G

SD-05 Design Data

Final Design Sustainability Notebook Submittal; G

Final Design High Performance and Sustainable Building Checklist; G

SD-11 Closeout Submittals

Final Sustainability Notebook Submittal; G

Final High Performance and Sustainable Building Checklist; G

Third Party Certification Plaque and Certificates; G

#### 1.4 GUIDING PRINCIPLES VALIDATION

Provide sustainability documentation to verify achievement of  
Federal Guiding Principles Validation (GPV).

Provide the following for GPV:

- a. A completed High Performance and Sustainable Building (HPSB) Checklist. (HPSB Checklist is described in the UFC 1-200-02 and for the Navy; this HPSB Checklist is the NAVFAC Sustainable Energy Data Record Card (NSEDRC). Therefore when this specification refers to the HPSB Checklist, it is actually referring to the NAVFAC Sustainable Energy Data Record Card.)
- b. Obtain Government approval of the HPSB Checklist from the Contracting Officer at the Post Award Kick-Off Meetings. Contracting Officer's approval establishes identified Guiding Principles Requirements as the project's sustainability goals.

No variations or substitutions to the HPSB Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved HPSB Checklist for this project. Contractor must demonstrate that change will not incur additional construction cost or increase the life cycle cost.

- c. Complete all design and construction work required to incorporate the applicable Guiding Principles Requirements indicated on the HPSB Checklist and in contract documents.
- d. Maintain an up-to-date Sustainability Notebook containing the following components:
  - (1) HPSB Checklist
  - (2) Sustainability Action Plan
  - (3) Documentation illustrating Guiding Principle Requirements compliance
  - (4) Commissioning Plan and Reports

#### 1.4.1 SUSTAINABILITY ACTION PLAN

Include the following information in the Sustainability Action Plan;

- a. Contractor's planned method to achieve each GP requirement.
- b. For each designated Federal Guiding Principles Requirement that is not attempted or achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.
- c. Name and contact information for: Contractor's Sustainability POC and other sustainability professional on the Contractor's Staff responsible for ensuring sustainability goals are accomplished and documentation is assembled.

#### 1.4.2 COSTS

Contractor is responsible for all costs associated with designing, constructing and demonstrating that project complies with approved Guiding Principles Requirements.

#### 1.4.3 CALCULATIONS

Provide all design data, calculations, product data, and certifications required in this specification to demonstrate compliance with the Guiding Principles Requirements.

#### 1.4.4 THIRD PARTY CERTIFICATION (TPC) Documentation

Contractor is responsible for achieving Third Party Certification (TPC) equivalent to **LEED GBDC Ref Guide Silver or GBI GP Compliance 2** globes . Government must approve equivalent TPC organization. An alternative TPC organization must demonstrate equivalency and provide explanation for Government consideration, prior to use on the project. Third Party Certification is met when Government receives TPC organization certificate and plaque.

Contractor is responsible for Third Party Certification, in addition to all requirements under header above "GUIDING PRINCIPLES VALIDATION (GPV)".

The Third Party Certification (TPC) requires the following:

- a. Provide a TPC Checklist from the certifying organization.
- b. Obtain approval of the TPC Checklist from the Contracting Officer. Contracting Officer's approval establishes identified TPC Requirements as the project's sustainability goals.

No variations or substitutions to the TPC Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved TPC Requirements for this project. Contractor must demonstrate that change will not incur additional construction cost or increase the life cycle cost. Contractor must also demonstrate that changes will not impact achieving required TPC certification level.

- c. Complete all design and construction work required to fulfill TPC Requirements.
- d. Maintain an up-to-date Sustainability Notebook. The Sustainability Notebook is in electronic format and is explained in paragraph entitled SUSTAINABILITY NOTEBOOK. The Sustainability Notebook contains the following components in addition to the GPV requirements under header above "GUIDING PRINCIPLES VALIDATION (GPV):
  - (1) TPC Checklist
  - (2) Completed TPC Online forms for each identified prerequisite and credit
  - (3) Copy of all correspondence with the TPC organization. Provide proof of TPC registration.
  - (4) Sustainability Action Plan
  - (5) TPC Award Certificate
  - (6) Commissioning Plan
- e. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:
  - (1) Contractor's planned method to achieve each TPC requirement.
  - (2) For each of the TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.
  - (3) Names and contact information for: Contractor sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled
  - (4) Provide the commissioning plan and schedule for performance testing.
- f. Contractor is responsible for all costs associated with designing, constructing, and demonstrating that project complies with approved TPC requirements, including but not limited to:
  - (1) Registration, review, certification and plaque fees.
  - (2) Online (or offline with secure facilities) TPC management and documentation.
  - (3) Obtaining TPC certification based on Government-approved sustainability goals.
  - (4) Design and construction work required to incorporate TPC prerequisites and credits.
  - (5) Submittals required demonstrating compliance with Government

approved TPC checklists.

- g. Provide all design data, calculations, product data, and certifications required in this specification to demonstrate compliance with the TPC Requirements.
- h. Register project with TPC organization. Use following format:

Project Title First Line:	U.S. Navy or U.S. Marine Corps, Building Name (if available)
Project Title Second Line:	P-(#); (1391 Project Name)
Project Address:	UIC (Installation Code); Category Code; RPUID (Real Property Unique Identifier) Number
Project Owner Organization:	U.S. Navy or U.S. Marine Corps
Primary Contact, Owner:	NAVFAC Project Manager
Additional Contact, Bldg. Owner:	Public Works Officer/Deputy Public Works Officer or a Designee

- i. Provide all online (or offline, with secure facilities) TPC management and documentation.
- j. Provide TPC Plaque and Certificates. Use the following format to create the Plaque, Certificate, and Letter of Congratulations. Forward to parties designated by Contracting Officer:

(1) Plaque

Name: Final Building Name. If unknown, use the Form DD1391 Project Name.

(2) Certificate

Project title, first line: P-(X); (1391 Project Name). Project  
title, second line: UIC (installation code)

(3) Letter of Congratulation

Address letter to the Facility's Installation Commander Name.  
Address the letter to an individual person.

#### 1.5 SUSTAINABILITY SUBMITTALS

Provide documentation in the Sustainability Notebook and the HPSB Checklist to indicate compliance with the sustainability requirements of the project.

##### 1.5.1 SUSTAINABILITY NOTEBOOK

Prepare and maintain a comprehensive Sustainability Notebook to document compliance with the sustainability requirements identified in the approved HPSB and TPC Checklists. Sustainability Notebook must contain all required

data to support full compliance with the Federal Guiding Principles Requirements and TPC requirements. Sustainability Notebook is in the form of an Adobe PDF file; bookmarked at each Federal Guiding Principles Requirement, TPC requirement, and sub-bookmarked at each document. Match format to Federal Guiding Principles numbering system indicated herein. Maintain up to date information, spreadsheets, templates, etc. with each current submittals. For TPC projects, provide a second Table of contents using TPC numbering system. Locate documentation unique to TPC here. Where TPC documentation would repeat GP documentation, insert note referring reviewer to GP documentation.

Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability Notebook information is not current, until information is updated and on track per project goals.

#### 1.5.1.1 SUSTAINABILITY NOTEBOOK SUBMITTAL SCHEDULE

Provide Sustainability Notebook Submittals at the following milestones of the project:

##### a. Preliminary Sustainability Notebook Submittal

Submit preliminary Sustainability Notebook for approval at the PostAward Kick-Off Meetings.

##### b. Final Design Sustainability Notebook Submittal

Submit updated Sustainability Notebook no later than 60 days after final design complete submission. Review Sustainability Notebook and TPC Online submission for completeness of design requirements, prerequisites, and credits documentation and appropriate progress toward construction requirements, prerequisites, and credits documentation. Identify any outstanding issues relating to achieving the sustainability goals of the project and incomplete documentation requirements. Obtain DOR approval and submit three (3) electronic copies of the Final Design Sustainability Notebook on DVDs to the Government.

##### c. Construction Progress Meetings.

Update GP and TPC documentation in the Sustainability Notebook and TPC Online tool for each meeting.

##### d. Final Sustainability Notebook Submittal

Submit updated Sustainability Notebook within 60 days after the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until Final Sustainability construction phase documentation is complete. Obtain DOR approval and submit three (3) electronic copies of the Final Sustainability Notebook on DVDs to the Government.

#### 1.5.2 HIGH PERFORMANCE SUSTAINABLE BUILDING (HPSB) CHECKLIST

Provide documentation proof of and support for compliance with a completed HBSP Checklist.

Submit an updated copy of the HPSB Checklist with each Sustainability Notebook submittal. Attach HPSB Checklist to Form DD1354 Real Property

Record Submittal.

In addition, submit a separate copy of the HPSB Checklist to the Contracting Officer for approval at the following project milestones;

- (1) [Preliminary High Performance and Sustainable Building Checklist](#) (HPSB) at the Post Award Kick-Off meeting.
- (2) [Final Design High Performance and Sustainable Building Checklist](#) (HPSB) not less than 60 days after design complete.
- (3) [Final High Performance and Sustainable Building Checklist](#) (HPSB) not less than 60 days after BOD.

The Checklist form is found at the following link;  
[http://www.wbdg.org/pdfs/navfac\\_sustainable\\_energy\\_data\\_record\\_card.pdf](http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf)

## 1.6 DOCUMENTATION REQUIREMENTS

Where the following Guiding Principle Requirements are applicable to the TPC project and have a corresponding LEED requirement cited, the LEED credit is mandatory for TPC Certification. Unless noted otherwise, documentation used to demonstrate TPC compliance may be used to demonstrate compliance with matching GP requirement.

Incorporate each of the following Federal Guiding Principles Requirements into project and provide documentation that proves compliance with each listed requirement.

Items below are organized according to the Guiding Principles. Note that the Guiding Principles use Roman numerals to denote categories of requirements. For projects that require TPC, refer to Third Party Certifier's reference manuals for TPC requirements.

The below list adds additional enumeration to further break down the Guiding Principles into the Guiding Principles Requirements. Where a Guiding Principle Requirement corresponds with a [LEED GBDC Ref Guide](#) prerequisite or credit, a LEED cross-reference is cited next to the Guiding Principles enumeration. These LEED credits are mandatory for TPC certification. Refer to TPC reference manual for reporting requirements.

### 1.6.1 Integrated Design Process

Guiding Principles (GP) Denotation - I.1

Provide integrated design process from beginning to end of project. Consider all stages of the building's lifecycle, including deconstruction. See instruction at Whole Building Design Guide:

[http://www.wbdg.org/design/engage\\_process.php#mjr](http://www.wbdg.org/design/engage_process.php#mjr)

a. Design submittal documentation required;

- (1) Identify and maintain an up-to-date list of the sustainability integrated team for the facility that includes;
  - (a) Contractors Sustainability Coordinators
  - (b) Architecture and engineering disciplines involved on the project and the DOR in charge of the overall project and each



discipline. Describe their roles and responsibilities.

(c) Construction Subcontractors and the company representatives that align with each architectural and engineering discipline.

(d) Coordinate with Government participants to identify and confirm sustainability requirements. Using Activity, Public Works, Asset Management, Environmental Specialist and other appropriate installation personnel must be considered a part of the Team.

(2) Provide a narrative explaining;

(a) How each discipline/subcontractor will be involved to achieve each Guiding Principle below.

(b) How the Subcontractors will be involved during design and how the designers will be involved during construction to provide an integrated design.

(c) How the Contractor will coordinate with Government personnel.

#### 1.6.2 COMMISSIONING (Cx)

GP Denotation - I.2; LEED EAp1 and EAc3

Work with the Commissioning Authority (CxA) to achieve requirements of the Commissioning plan and other document requirements at each stage of Commissioning. Maintain up-to-date records of Commissioning activities in Sustainability Notebook.

a. Provide construction submittal documentation required below. Coordinate with Section 01 45 00.05 20, DESIGN AND CONSTRUCTION QUALITY CONTROL.

(1) Commissioning Authority certifications.

(2) Commissioning Authority qualifications.

(3) Commissioning meeting minutes during construction.

(4) Commissioning Plan, updated at each project stage.

(5) For each commissioned system, completed pre-startup checklist, completed functional verification checklist and performance verification test report.

(6) Final Commissioning report and narrative demonstrating project's fundamental Commissioning requirements have been successfully executed.

#### 1.6.3 Optimize Energy Performance

GP Denotation - II.1; LEED Eap2, EAc1

Reduce energy consumption by 30 percent or more below ASHRAE 90.1 - IP or the International Energy Conservation Code (IECC) for low rise residential facilities. For renovations of at least 50 percent Property Real Value (PRV): Reduce energy consumption by 20 percent or more below pre-renovations 2003 CBECS baseline (calculate according to US Code of

Regulations 10 CFR 433, 434, 435, Dec. 4, 2006).

a. Design submittal documentation required;

(1) Provide documentation showing total percentage of proposed building energy performance improvement over cited standards baseline.

(a) Submit calculations demonstrating project meets the energy consumption reduction (including process and receptacle loads) required.

b. Construction submittal documentation required;

(1) Provide Energy Star Certification

#### 1.6.4 Energy Efficient Equipment

GP Denotation - II.3

Provide only energy-using equipment that is Energy Star or has Federal Energy Management Program (FEMP) recommended efficiency. Where Energy Star or FEMP recommendations have not been established, provide equipment with efficiency in the top 25 percent for the type of equipment procured. Provide only energy using equipment that meet FEMP requirements for low standby power consumption. Energy efficient equipment can be found at: <http://www1.eere.energy.gov/femp/> and <http://www.energystar.gov/>

a. Construction submittal documentation required;

(1) Provide proof that equipment is energy efficient and complies with the cited requirements.

#### 1.6.5 On-site Renewable Energy Generation

GP Denotation - II.5.

Provide project energy needs thru on-site renewable energy generation.

a. Design submittal documentation required;

(1) Provide documentation showing total on-site renewable energy to be installed as a percentage of proposed building energy consumption.

#### 1.6.6 Building-level Power Metering

GP Denotation - II.6

Install building-level meters of electricity, natural gas (and steam where applicable) use.

a. Design submittal documentation required;

(1) Provide design drawings that highlight meter locations on the site.

#### 1.6.7 Benchmarking

GP Denotation - II.7.

Provide report of baseline data with the energy design targets.

a. Construction submittal documentation required;

- (1) Provide a Prefinal Performance Report with data collected from the first 60 days of operation of the facility after Beneficial Occupancy Date (BOD). Submit this information with the Final Sustainability Documentation Submittal.

#### 1.6.8 Water Consumption

GP Denotation - III.1; LEED WEp1

Reduce water consumption by 20 percent or more beyond EAct 1992, by implementing the requirements of [UFC 1-200-02](#).

a. Design submittal documentation required

- (1) Provide documentation showing potable water consumption is reduced by cited standard.

#### 1.6.9 Building-level Water Metering

GP Denotation - III.2.

Install building-level meters for water use.

a. Design submittal documentation required;

- (1) Provide design drawings that highlight meter locations on the site.

#### 1.6.10 Landscape Irrigation

GP Denotation - III.4; LEED WEc1

Reduce potable water landscape irrigation by 50 percent or more.

a. Design submittal documentation required

- (1) Provide documentation showing potable water consumption used for landscape irrigation is reduced by 50 percent compared to baseline case, or
- (2) No potable water is used for landscape irrigation.

#### 1.6.11 Stormwater Management

GP Denotation - III.6 and 7

Meet the requirements of [UFC 3-210-10](#).

a. Design submittal documentation required

- (1) Provide documentation showing storm water is managed on site per cited criteria.

#### 1.6.12 Water Use for Heating and Cooling

GP Denotation - III.8.

Reduce Process Water consumption.

a. Design submittal documentation required

- (1) Provide required documentation showing compliance with EPAct 2005, Section 109 where life cycle cost effective.

1.6.13 Water Conserving Fixtures

GP Denotation - III.9.

Use water-consuming products that meet or exceed EPA's WaterSense criteria.

a. Design submittal documentation required;

- (1) Provide design drawings that highlight the requirement for EPA Watersense products
- (2) Provide documentation that indicates the most efficient water fixtures available, when EPA Watersense product categories are not available.

1.6.14 Thermal Comfort

GP Denotation - IV.1; LEED IEQc7.1

Design to meet ASHRAE 55 (Section 6.2 is not required).

a. Design submittal documentation required;

- (1) Provide documentation showing that HVAC systems and the building envelope have been designed to meet the requirements of ASHRAE 55

1.6.15 Ventilation Rates

GP Denotation IV.2; LEED IEQp1

Design to meet or exceed ASHRAE 62.1.

a. Design submittal documentation required

- (1) For mechanically ventilated buildings, provide documentation showing project HVAC system meets minimum requirements of Sections 4 through 7 of ASHRAE 62.1.
- (2) For naturally ventilated buildings, provide documentation showing project meets minimum requirements of ASHRAE 62.1 Paragraph 5.1.

1.6.16 Moisture Control Plan

GP Denotation IV.3; LEED IEQc10

Create and implement a moisture control plan for controlling moisture flows and condensation to prevent building damage and mold contamination. Include design details for envelope and HVAC humidity controls, construction material storage and protection, humidity controls during construction, and operation and maintenance plan for ongoing building moisture control.

#### 1.6.17 Daylighting

GP Denotation IV.4; LEED IEQc8.1and IEQc6.1

Achieve a minimum daylight factor per **UFC 1-200-02** for 75 percent of all regularly occupied spaces that require critical visual tasks. Provide automatic dimming controls or accessible manual controls and appropriate glare control.

a. Design submittal documentation required

- (1) Floor plans and calculations delineating requirements.

#### 1.6.18 Reduce Volatile Organic Compounds (VOC)

GP Denotation - IV.6; LEED IEQc4.1, 4.2, 4.3, 4.4, 4.5,4.6

Provide materials & products with ingredients, components and emissions that meet the volatile organic compound levels cited in the **UFC 1-200-02**. Products include adhesives, sealants, paints, coatings, carpet and flooring systems, wood panel products, furnishings, walls and ceilings.

a. Construction submittal documentation required

- (1) Provide documentation showing that materials do not exceed maximum VOC emissions of cited standards. Use VOC averaging to assure maximum paint and coating performance on painted items that are subject to human contact or harsh environmental conditions.
- (2) Provide required documentation showing that flooring materials comply with (VOC) emissions of cited standards.
- (3) Provide documentation showing that composite wood and agrifiber products and associated laminating adhesives contain no added urea-formaldehyde.
- (4) Provide documentation showing that furniture and seating is third party certified.
- (5) Provide documentation showing that all gypsum board, insulation, acoustical ceiling systems and wall coverings installed in building interior meet cited standards.

#### 1.6.19 Indoor Air Quality During and After Construction

GP Denotation - IV.7 and 8; LEED IEQc3.1 and 3.2

Prior to construction, create indoor air quality plan. Implement IAQ plan during construction & flush building air before occupancy.

a. Construction submittal documentation required

- (1) Provide IAQ management plan for the construction and preoccupancy phases of the building. For renovation of occupied existing buildings, developed and implemented in accordance with **ANSI/SMACNA 008** Indoor Air Quality Guidelines for Occupied Buildings under Construction.
- (2) Provide required documentation showing that after construction

ends and prior to occupancy, new HVAC filters were installed and building air was flushed out in accordance with UFC 1-200-02, with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent.

#### 1.6.20 Recycled Content

GP Denotation - V.1;LEED MRc4

Provide materials on this project with aggregated total recycled content greater than 10 percent. In addition comply with 40 CFR 247. Refer to <http://www.epa.gov/cpg/products.htm> for assistance identifying products cited in 40 CFR 247.

##### a. Construction submittal documentation required

- (1) Total amount of recycled content contained in building materials as a percentage of total cost of all building materials on the project (mechanical, electrical and plumbing components, and specialty items such as elevators excluded).
- (2) Substitutions: In case of conflict between projects recycled content goals and individual technical section requirements, Contractor may submit for Government approval proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. For all such proposed substitutions, submit with the Sustainability Action Plan accompanied by product data demonstrating equivalence.

#### 1.6.21 Bio-Based Products

GP Denotation - V.2; LEED MRc6

Utilize products and materials made from bio-based materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Bio-based is defined as commercial or industrial products (other than food or feed) that are composed in whole, or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials. Bio-based products that are designated for preferred procurement under USDA Biopreferred Program must meet the required minimum bio-based content. Refer to [www.biopreferred.gov](http://www.biopreferred.gov) for the product categories and BioPreferred Catalog.

##### a. Construction submittal documentation required

- (1) Provide bio-based content and bio-based source of material. Indicate name of the manufacturer, cost of each product and the use of each product on this project.

#### 1.6.22 Recycling - Design

GP Denotation - V.6; LEED MRp1

Provide a dedicated, easily-accessible area or areas for the collection and

storage of materials for recycling for the entire building. Collection must include, at a minimum: paper, corrugated cardboard, glass, plastics and metals.

a. Design submittal documentation required

- (1) Provide documentation showing an appropriately sized and placed storage room has been dedicated for recyclables.

1.6.23 Recycling - Construction

GP Denotation - V.6; LEED MRc2

Divert construction debris from landfill disposal in accordance with Section 01 74 19.05 20 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD.

a. Construction submittal documentation

- (1) Documentation showing total amount of construction debris diverted from landfill as a percentage of all construction debris on the project.
  - (a) Include project's Construction Waste Management Plan and all dumpster haul tickets.

1.6.24 Ozone Depleting Substances

GP Denotation - V.7; LEED EAp3

Eliminate the use of ozone depleting substances during and construction and in building design where alternative environmentally preferable products are available, consistent with either the Montreal Protocol and Title VI of the Clean Air Act Amendment of 1990, or equivalent overall air quality benefits that take into account lifecycle impacts.

(a) Construction submittal documentation required

- (1) MSDS sheets for all refrigerants provided
- (2) Use substances that meet the criteria of U.S. EPA Significant New Alternatives Policy (<http://www.epa.gov/ozone/snap/index.html>)

1.6.25 Validation and Certification Restrictions

The purchase of renewable energy credits to meet project sustainability goals is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

3.1.1 Coordinating Sustainability Documentation Progress

Provide sustainability focus and coordination at the following meetings to

achieve sustainability goals. In addition to requirement below, the following meetings requirements are further described in other parts of the RFP documents. Contractor's designated TPC accredited sustainability professional responsible for GP and TPC documentation must participate in the following meetings to coordinate documentation completion:

- a. Design Review Meetings: Review progress towards meeting Sustainability Action Plan, and completeness of Sustainability Notebook, and TPC Online submission at the following;
  - (1) Post Award Kick-Off Meeting: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS. Discuss the following: TPC and HPSB Checklist, Sustainability Action Plan, Design submittal and Construction submittal requirements and schedule, individuals responsible for achieving each Guiding Principle Requirement and TPC prerequisite and credit.
  - (2) Design Quality Assurance Meetings: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS for requirements. Discuss progress toward accomplishing Sustainability goals and obtaining sustainability documentation at each design submittal review. Refer to RFP Part 2 Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES for designated design submittals.
  - (3) Design Complete Review Meetings (No later than 60 days after final design complete submission): Review Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final score and documentation requirements.
- b. Construction Progress Meetings: Review GP and TPC sustainability requirements with project team including contractor and sub-contractor representatives. Demonstrate GP and TPC documentation is being collected and updated to the Sustainability Notebook and TPC Online tool.
  - (1) Project Closeout Meetings: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS for further requirements. Review Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final documentation requirements.
  - (2) Final Sustainability Notebook Review

### 3.2 SUSTAINABILITY AWARD

Finalize the sustainability certification process and obtain the TPC Certification Plaque/Certificates, indicating completion of the projects sustainability goals.

#### 3.2.1 Third Party Certification Plaque and Certificates

Obtain and install plaque and provide one original framed copy of the



certificate. Mount certificates in 25 mm 1 inch deep metal frames, with double matt, and wire hangers. Obtain two additional certificates, and deliver to Contractor Officer, unless otherwise instructed. Hang the Plaque in a prominent interior location approved by the Contracting Officer.

-- End of Section --

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SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS  
01/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/HFES 100 (2007) Human Factors Engineering of  
Computer Workstations

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.32 (2012) Fall Protection

ASSE/SAFE A10.34 (2001; R 2012) Protection of the Public on  
or Adjacent to Construction Sites

ASSE/SAFE A1264.1 (2007) Safety Requirements for Workplace  
Walking/Working Surfaces and Their Access;  
Workplace, Floor, Wall and Roof Openings;  
Stairs and Guardrails Systems

ASSE/SAFE Z359.0 (2012) Definitions and Nomenclature Used  
for Fall Protection and Fall Arrest -  
Version 3

ASSE/SAFE Z359.1 (2007) Safety Requirements for Personal  
Fall Arrest Systems, Subsystems and  
Components

ASSE/SAFE Z359.2 (2007) Minimum Requirements for a  
Comprehensive Managed Fall Protection  
Program

ASSE/SAFE Z359.3 (2007) Safety Requirements for Positioning  
and Travel Restraint Systems

ASSE/SAFE Z359.4 (2013) Safety Requirements for  
Assisted-Rescue and Self-Rescue Systems,  
Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.22 (2010) Articulating Boom Cranes

ASME B30.3 (2012) Tower Cranes

ASME B30.5 (2011) Mobile and Locomotive Cranes

ASME B30.8 (2010) Floating Cranes and Floating

Derricks

ASTM INTERNATIONAL (ASTM)

ASTM F855 (2014) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048 (2003) Guide for Protective Grounding of Power Lines

IEEE C2 (2012; Errata 2012; INT 1-4 2012; INT 5-7 2013) National Electrical Safety Code

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z87.1 (2010) Occupational and Educational Personal Eye and Face Protection Devices

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 1 (2012; TIA 11-1) Fire Code

NFPA 10 (2013) Standard for Portable Fire Extinguishers

NFPA 241 (2013) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NFPA 306 (2014) Standard for Control of Gas Hazards on Vessels

NFPA 51B (2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3 2014) National Electrical Code

NFPA 70E (2012; Errata 2012) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008; Errata 2011) Safety and Health Requirements Manual

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD HDBK 743A (1991) Anthropometry of US Military Personnel

MIL-STD-1472 (2012; Rev G) Human Engineering

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD (2009) Manual on Uniform Traffic Control Devices

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards  
29 CFR 1910.146 Permit-required Confined Spaces  
29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)  
29 CFR 1915 Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment  
29 CFR 1926 Safety and Health Regulations for Construction  
29 CFR 1926.1400 Cranes & Derricks in Construction  
29 CFR 1926.16 Rules of Construction  
29 CFR 1926.500 Fall Protection  
CPL 2.100 (1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

NAVFAC P-307 (2009; Change 1 Mar 2011; Change 2 Aug 2011) Management of Weight Handling Equipment  
ND OPNAVINST 5100.23 (2005; Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

1.2 DEFINITIONS

- a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.
- b. High Visibility Accident. Any mishap which may generate publicity or high visibility.
- c. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.
- d. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers and crane walkers, rigging gear between the hook and the load, the load and the crane's

supporting structure (ground, rail, etc.).

- e. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:
  - (1) Death, regardless of the time between the injury and death, or the length of the illness;
  - (2) Days away from work (any time lost after day of injury/illness onset);
  - (3) Restricted work;
  - (4) Transfer to another job;
  - (5) Medical treatment beyond first aid;
  - (6) Loss of consciousness; or
  - (7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.
- f. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.
- g. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.) Any mishap meeting the criteria described above shall be documented in both the Contractor Significant Incident Report (CSIR) and using the NAVFAC prescribed Navy Crane Center (NCC) form submitted within five days both as provided by the Contracting Officer. Comply with additional requirements and procedures for accidents in accordance with NAVFAC P-307, Section 12.
- h. Internal Traffic Control Plan (ITCP). Strategies to control the flow of construction workers, vehicles and equipment inside the work zone.

### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES:

Government acceptance is required for submittals with a "G, A" designation.

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, A

Activity Hazard Analysis (AHA); G, A

Crane Critical Lift Plan; G, A

Proof of qualification for Crane Operators; G, A

Traffic Control Plan; G, A

Standard Hand Signals; G, A

#### SD-06 Test Reports

##### Notifications and Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Notifications and Reports."

##### Accident Reports

##### Crane Reports

Arc Flash Risk/Hazard Analysis; G

#### SD-07 Certificates

Confined Space Entry Permit

Hot work permit

Arc Flash Risk/Hazard Analysis Qualifications; G

Contractor Electrical Energized Work Permit; G

Contractor Safety Self-Evaluation Checklist; G, A

Certificate of Compliance (Crane)

Submit one copy of each permit/certificate attached to each Daily **Quality Control** Report.

#### 1.4 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. Complete the checklist monthly and submit with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90 may result in retention of up to 10 percent of the voucher. Additionally, provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher. The Contracting Officer will submit a copy of the Contractor Safety Self-Evaluation and Monthly Exposure Report to the local safety and occupational health office.

## 1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, NFPA 70E, IEEE C2 and federal, state, and local, laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

## 1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

### 1.6.1 Personnel Qualifications

#### 1.6.1.1 Site Safety and Health Officer (SSHO)

The SSHO must meet the requirements of EM 385-1-1 section 1 and ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Designated Representative/alternate shall be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO's training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17, entitled SITE SAFETY AND HEALTH OFFICER (SSHO), and all associated sub-paragraphs.

A Competent Person shall be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for acceptance in consultation with the Safety Office.

#### 1.6.1.1.1 Contractor Quality Control (QC) Person

The Contractor Quality Control Person can be the SSHO on this project.

#### 1.6.1.2 Competent Person for Confined Space Entry

Provide a competent person for confined space meeting the definition and requirements of EM 385-1-1. All confined and enclosed space work shall comply with NFPA 306 or as applicable, 29 CFR 1910.147 for general industry.

#### 1.6.1.3 Crane Operators

Meet the crane operators requirements in USACE EM 385-1-1, Section 16 and Appendix I. In addition, for mobile cranes, designate crane operators as qualified by a source that qualifies crane operators (i.e., union, a government agency, or and organization that tests and qualifies crane operators). Provide proof of current qualification. In addition, the Contractor shall comply with Contractor Operated Crane Requirements included in the latest revision of document NAVFAC P-307 Section 1.7.2 "Contractor Operated Cranes," and Appendix P, Figure P-1 and with 29 CFR 1926, Subpart CC.



### 1.6.2 Personnel Duties

#### 1.6.2.1 Site Safety and Health Officer (SSHO)

The SSHO shall:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily **quality control** report.
- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPS and AHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.
- h. **Ensure an approved "Contractor Electrical Energized Work Permit" prior to starting any activity on energized electrical systems.**
- i. Maintain a list of hazardous chemicals on site and their material safety data sheets.

Failure to perform the above duties will result in dismissal of the superintendent, QC Manager, and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

### 1.6.3 Meetings

#### 1.6.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal,

review, and acceptance of AHAs to preclude project delays.

- c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.
- d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

#### 1.6.3.2 Safety Meetings

Conduct and document meetings as required by EM 385-1-1. Attach minutes showing contract title, signatures of attendees and a list of topics discussed to the Contractors' daily quality control report.

#### 1.7 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer, the Contractor Quality Control Manager, and any designated CSP or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site. Continuously review and amend the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

#### 1.7.1 EM 385-1-1 Contents

In addition to the requirements outlined in Appendix A of USACE EM 385-1-1, the following is required:

- a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSs, CHSTs. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.
- c. Confined Space Entry Plan. Develop a confined and/or enclosed space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)
- d. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:
  - (1) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400.
- e. Fall Protection and Prevention (FP&P) Program Documentation. The program documentation shall be site specific and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A qualified person for fall protection shall prepare and sign the program documentation.

Include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Revise the Fall Protection and Prevention Program **Documentation** every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Program **Documentation** at the job site for the duration of the project. Include the Fall Protection and Prevention Program **Documentation** in the Accident Prevention Plan (APP).

The FP&P Plan shall include a Rescue and Evacuation Plan in accordance with USACE **EM 385-1-1**, Section 21.M. The plan shall include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan in the Fall Protection and Prevention (FP&P) Plan, and as part of the Accident Prevention Plan (APP).

- f. Occupant Protection Plan. The safety and health aspects of lead-based paint removal, prepared in accordance with Section **02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD**.
  - g. Lead Compliance Plan. The safety and health aspects of lead work, prepared in accordance with Section **02 83 13.00 20 LEAD IN CONSTRUCTION**.
  - h. Asbestos Hazard Abatement Plan. The safety and health aspects of asbestos work, prepared in accordance with Section **02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS**.
  - i. Site Safety and Health Plan. The safety and health aspects prepared in accordance with Section **01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES**.
  - j. PCB Plan. The safety and health aspects of Polychlorinated Biphenyls work, prepared in accordance with Sections **02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)** and **02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS**.
  - k. Site Demolition Plan. The safety and health aspects prepared in accordance with Section **02 41 00 DEMOLITION** and referenced sources. Include engineering survey as applicable.
  - l. Excavation Plan. The safety and health aspects prepared in accordance with Section **31 23 00.00 20 EXCAVATION AND FILL**.
- 1.8 **ACTIVITY HAZARD ANALYSIS (AHA)**

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE **EM 385-1-1**, Section 1. **NAVFAC Midlant shall follow latest edition authorized by command**. Submit the AHA for review at least 7 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when

procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

#### 1.9 DISPLAY OF SAFETY INFORMATION

Within 1 calendar day after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, shall be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:

- a. Confined space entry permit.
- b. Hot work permit.
- c. Contractor Electrical Energized Work Permit.

#### 1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

#### 1.11 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

#### 1.12 NOTIFICATIONS AND REPORTS

##### 1.12.1 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

##### 1.12.2 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, property damage accidents resulting in at least \$20,000 in damages, and near misses as defined in EM 385-1-1, to establish the root cause(s) of

the accident. Complete the Contractor Incident Report (CIR), and electronically file the report in ESAMS within 5 calendar day(s) of the accident.

- b. Near Misses: Complete the applicable documentation in NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS).
- c. Conduct an accident investigation for any weight handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

#### 1.12.3 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

#### 1.12.4 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 Section 16 and Appendix I. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

#### 1.13 HOT WORK (Welding And Cutting, Etc.)

Hot work permits will only be issued to the Prime Contractor. Prime Contractor shall notify FEAD/ROICC office of issuance of hot work permits and all renewals of hot work permits. Copies of all hot work permits and renewals shall be attached to daily quality control reports.

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in

memory the emergency **Fire Division** phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE **FIRE DIVISION** IMMEDIATELY.

#### 1.14 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

#### 1.15 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

#### 1.16 CONFINED SPACE ENTRY REQUIREMENTS.

Contractors entering and working in confined spaces performing general industry work are required to follow the requirements of OSHA 29 CFR 1910, 29 CFR 1910.146, and EM 385-1-1 Section 34 Confined Space Entry.

NAVFAC personnel entering and working in confined spaces performing non-maritime facility work are required to follow the requirements of ND OPNAVINST 5100.23 Chapter 27.

#### 1.17 TRAFFIC CONTROL

The requirements contained in this paragraph are in addition to the requirements contained in EM 385-1-1. In case of a conflict, the more stringent requirement applies. Traffic Control shall be accomplished in accordance with MUTCD.

##### 1.17.1 Traffic Control Plan

Prior to the commencement of contract operations, the Contractor shall submit for acceptance the complete details of the proposed **traffic control plan** for the maintenance of traffic and access through the contract work area.

Include traffic control and traffic control signal systems in each Activity Hazard Analysis as applicable.

##### 1.17.2 Signal Systems, Personnel And Procedures

Signal systems, personnel and procedures shall comply with EM 385-1-1 Section 08.B SIGNAL SYSTEMS, PERSONNEL AND PROCEDURES.

##### 1.17.2.1 Standard Hand Signals

**Standard hand signals** shall be submitted for acceptance and shall be posted at the operator's position, signal control points and other points as

necessary to inform those concerned.

#### 1.17.3 Road Closings

Traffic control is extremely important on highways, in residential areas, and at construction sites. When traffic may pose a hazard to operations, public roads will be closed. Road closings shall be coordinated in writing with appropriate local agencies. Traffic controls and signage shall comply with MUTCD.

#### 1.17.4 Operating Precautions

When a road cannot be closed, the following precautions shall be taken:

- a. "FLAGGER" (MUTCD W-20-7) or "WORKERS AHEAD: (W21-1) or similar appropriate signs shall be placed along the roadway, 1,000 ft (304.8m) and 500 ft (30.5 m) before the work zone, on both sides of the work zone".
- b. Sufficient number of flag persons shall be used to control traffic within the work area.
- c. Flag persons shall be used and shall receive instruction in flagging operations before being placed in traffic (training and certification by the National Safety Council (NSC) is recommended).
- d. All flag persons shall wear high-visibility apparel in accordance with EM 385-1-1, paragraph 05.F, safety-toed footwear and hard hats.
- e. "STOP/SLOW" paddles, preferably mounted on a 6 ft staff, will be used for traffic control.
- f. Flag persons shall be able to communicate with each other and with the foreman, and effectively signal/direct the affected public.
- g. Two-way radios shall be used whenever visual contact between flaggers is not maintained.

#### 1.17.5 Construction Vehicles

All construction vehicles and all vehicles exceeding 1-1/2 tons (1360.8 kg) shall have a signal person to assist in backing and maneuvering in residential and construction areas.

#### 1.17.6 Internal Traffic Control Plans (ITCP)

Internal traffic control plans (ITCP) (written plans which address separation and safety of personnel and moving equipment) will be attached to all AHA's when interaction between personnel and moving equipment will occur or physical changes occur onsite which could affect personnel or moving equipment.

## PART 2 PRODUCTS

### 2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording:  
"DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a



minimum of **one inch** in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from **5 feet**.

### PART 3 EXECUTION

#### 3.1 CONSTRUCTION AND/OR OTHER WORK

Comply with USACE EM 385-1-1, NFPA 1, NFPA 70, NFPA 70E, NFPA 241, IEEE C2, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is required at all times, in accordance with EM 385-1-1, for all personnel who enters a construction site area. In addition to the requirements of EM 385-1-1, Safety Glasses ANSI/ISEA Z87.1 will be worn at all times on construction sites, unless the competent person identifies in the Contractor's accepted activity hazard analysis that an equal or greater hazard is presented in the mandatory wearing of safety glasses. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

Mandatory PPE on all construction sites includes:

- a. Hard Hat
- b. Safety Glasses
- c. Safety-Toed Shoes or Boots
- e. Hearing protection

##### 3.1.1 Hazardous Material Use

Each hazardous material must receive approval from the Contracting Officer or their designated representative prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

##### 3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

##### 3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and

friable and non-friable asbestos, and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

### 3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist. For electrical work positive cable/circuit identification must be made prior to submitting any outage request. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Following the application of lockout/tag out devices to all hazardous energy sources, applicable AHA should outline equipment restart methods to ensure "zero energy" state has been accomplished.

### 3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

### 3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

#### 3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with USACE EM 385-1-1, Section 21.B.

#### 3.4.2 Fall Protection Equipment and Systems

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section

21. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, Paragraphs 21.N through 21.N.04. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 and ASSE/SAFE A10.32.

#### 3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

#### 3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

##### a. Low Sloped Roofs:

- (1) For work within 6 feet of an edge, on low-slope roofs, protect personnel from falling by use of personal fall arrest systems, guardrails, or safety nets. A safety monitoring system used by itself as the only form of fall protection system is not adequate fall protection and is not authorized.
- (2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

##### b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

#### 3.4.4 Horizontal Lifelines

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

#### 3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

#### 3.4.6 Rescue and Evacuation Procedures

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

#### 3.4.7 Fall Prevention During Design Phase

During design phase the Contractor shall consider and eliminate fall hazards encountered during the operation and maintenance evolutions of the facility. If it is not feasible to eliminate or prevent the need to work at heights with its subsequent exposure to fall hazards, control measures should be included in the design to protect personnel conducting maintenance work after completion of the project. In addition to the detailed requirements included in the provisions of this contract, the design work shall incorporate the requirements of 29 CFR 1910 Standards and ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE A1264.1, and NFPA 1.

#### 3.5 SCAFFOLDING

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access scaffold platforms greater than 20 feet maximum in height by use of a scaffold stair system. Do not use vertical ladders commonly provided by scaffold system manufacturers for accessing scaffold platforms greater than 20 feet maximum in height. The use of an adequate gate is required. Ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Give special care to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Place work platforms on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

### 3.6 EQUIPMENT

#### 3.6.1 Material Handling Equipment

- a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Additionally, when material handling equipment is used as a crane it must meet NAVFAC P-307 requirements in Sections 1.7.2, "Contractor Operated Cranes," and 12, "Investigation and Reporting of Crane and Rigging Gear Accidents."
- c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA. Proof of qualifications for operator shall be kept on the project site and addressed as part of the AHA.

#### 3.6.2 Weight Handling Equipment

- a. Equip cranes and derricks as specified in EM 385-1-1, section 16.
- b. Notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Prior to cranes entering federal activities, a Crane Access Permit must be obtained from the Contracting Officer. A copy of the permitting process will be provided at the Preconstruction Conference. Contractor's operator shall remain with the crane during the spot check.
- c. Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- e. Under no circumstance shall a Contractor make a lift at or above 90 percent of the crane's rated capacity in any configuration.
- f. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11, NAVFAC P-307 Figure 10-3 and ASME B30.5 or ASME B30.22 as applicable.
- g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane.
- h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- i. All employees must keep clear of loads about to be lifted and of

suspended loads.

- j. Use cribbing when performing lifts on outriggers.
- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- l. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.
- m. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.
- n. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
- o. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. This maximum wind speed determination shall be included as part of the activity hazard analysis plan for that operation.

### 3.6.3 Machinery and Mechanized Equipment

- a. Proof of qualifications for operator shall be kept on the project site for review.
- b. Manufacturer specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.
- c. Machinery & Mechanized Equipment are subject to additional Navy proof of certification. A certification form for acceptance by the Contracting Officer prior to being placed into use may be required.

### 3.6.4 USE OF EXPLOSIVES

Explosives shall not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval shall not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, shall be only where directed and in approved storage facilities. These facilities shall be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

### 3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1. A competent person for excavation must be on site during all excavation work.

#### 3.7.1 Utility Locations

All underground utilities in the work area must be positively identified by a third party, independent, private utility locating company in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

#### 3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

#### 3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company shall locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

#### 3.7.4 Location of Underground Utilities

Location and Protection of underground utilities shall be the responsibility of the Contractor. Where existing-to-remain piping, utilities, and underground obstructions of any type are indicated in locations to be traversed by new piping, ducts, and other evacuations, the elevations of the existing utilities and obstructions shall be determined before the new work is completed.

- a. In addition, the Contractor shall be responsible for obtaining the services of a professional utility locator prior to digging. Contractor shall provide documentation that the site has been surveyed and checked for underground utilities. All utilities shall be located, including but not limited to power, water, sewer, storm drains, fiber optics, T.V. cable, telephone, and intrusion detection wiring. A set of known utility drawings will be available in the OICC office for review to assist the locator.
- b. It is mandatory that the Contractor also contact the Base Telephone Office at (910) 451-2531 prior to accomplishing any digging at Camp Lejeune. A telephone office representative will assist in locating

telephone lines.

- c. It is mandatory that the Contractor also contact Charter Communications, cable TV service prior to accomplishing any digging at Camp Lejeune, to ensure that all buried cable lines are identified. Contact Mr. Olin Criswell at (910) 353-8677 for assistance.
- d. It is mandatory that the Contractor also contact the North Carolina One-Call Center to coordinate the location of underground natural gas infrastructure. North Carolina 811, Inc. can be reached at 811 on a touch-tone phone in the state of North Carolina or toll-free at 1-800-632-4949 if calling from out of state. Work request may also be submitted online at [www.nc811.org](http://www.nc811.org).

#### 3.7.4.1 The Locations of Underground Utilities

The locations of underground utilities shown are only approximate and the information provided may be incomplete. Contractor shall attempt to ascertain locations of existing underground utilities prior to and during digging operations.

#### 3.7.4.2 Damage to Underground Utilities

Immediate notice shall be delivered to the Contracting Officer of any damage. The Contractor shall make temporary repairs immediately and shall provide permanent repairs as soon as practicable.

### 3.8 ELECTRICAL

#### 3.8.1 Conduct of Electrical Work

As delineated in [EM 385-1-1](#) electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases an energized work permit shall be obtained from the contracting officer. The energized work permit application shall be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attachment of temporary grounds shall be in accordance with [ASTM F855](#) and [IEEE 1048](#). Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the [NFPA 70](#), high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by [NFPA 70E](#). Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Contractor shall ensure that each employee is familiar with and complies with these procedures and [29 CFR 1910.147](#).



### 3.8.2 Arc Flash Risk/Hazard Analysis

Contractor shall provide an Arc Flash Risk/Hazard Analysis in accordance with NFPA 70E for all locations where workers may be exposed to arc flash hazard (work on energized electrical equipment). The Arc Flash Risk/Hazard Analysis shall be sealed and signed by a qualified professional engineer.

In addition to Arc Flash Risk/Hazard Analysis required for safety during construction, provide an Arc Flash Risk/Hazard Analysis for the entire electrical distribution system as constructed. Provide equipment labels as required by NFPA 70E.

### 3.8.3 Arc Flash Risk/Hazard Analysis Qualifications

Contractor shall engage the services of a qualified organization to provide Arc Flash Risk/Hazard Analysis of the electrical distribution system. Organization shall be independent of the supplier, manufacturer, and installer of the equipment. The organization shall be a first tier subcontractor. This work shall not be performed by a second tier subcontractor.

- a. Submit name and qualifications of organization. Organization shall have been regularly engaged in providing Arc Flash Risk/Hazard Analysis for a minimum of 5 years.
- b. Submit name and qualifications of the professional engineer performing the analysis. Include a list of three comparable jobs performed by the engineer with specific names and telephone numbers for reference.

### 3.8.4 Contractor Electrical Energized Work Permit

All work on energized electrical systems must have an approved/signed Contractor Electrical Energized Work Permit. The results of the Arc Flash Risk/Hazard Analysis shall be included in the "Contractor Electrical Energized Work Permit" request. Flame-resistant (FR) clothing and personal protective equipment (PPE) shall be rated for a minimum of 8 calories per square centimeter even if the flash hazard analysis indicates a lower value. A blank copy of the permit request is appended to this Section. An editable version may be obtained from the Contracting Officer.

### 3.8.5 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately remove from service all damaged extension cords. Portable extension cords shall meet the requirements of EM 385-1-1, NFPA 70E and OSHA electrical standards.

## 3.9 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, OSHA Directive CPL 2.100 and OSHA 29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

- a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 34 of USACE

EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

- b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.
- c. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection in addition to continuous forced air ventilation regardless of space classification.

### 3.10 ERGONOMICS CONSIDERATIONS DURING DESIGN PHASE

Facilities, processes, job tasks, tools and materials shall be designed to reduce or eliminate work-related musculoskeletal (WMSD) injuries and risk factors in the workplace. Designs shall ensure facility maintenance access is designed to reduce WMSD risk factors to the lowest level possible. In addition to the detailed requirements included in the provisions of this contract, the design work shall incorporate the requirements of MIL-STD-1472, DOD HDBK 743A and ANSI/HFES 100.

-- End of Section --

**CONTRACTOR ELECTRICAL ENERGIZED WORK PERMIT**

**PART I: TO BE COMPLETED BY THE REQUESTER:** CONTRACT NUMBER: \_\_\_\_\_

JO/DO NUMBER \_\_\_\_\_

DATE OF REQUEST: \_\_\_\_\_

ANTICIPATED DATE WORK IS TO BE PERFORMED: \_\_\_\_\_

(1) Description of circuit/equipment/job location: \_\_\_\_\_  
\_\_\_\_\_

(2) Description of work to be done: \_\_\_\_\_  
\_\_\_\_\_

(3) Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage: \_\_\_\_\_  
\_\_\_\_\_

**NOTE: ATTACHED COPY OF OUTAGE REQUESTS INCLUDING REASONS FOR DENIAL**

\_\_\_\_\_  
Requester/Title

\_\_\_\_\_  
Date

**PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK:**

**Check when  
Complete**

(1) Detailed job description procedure to be used in performing the above detailed work: \_\_\_\_\_

☐

(2) Description of the Safe Work Practices to be employed: \_\_\_\_\_

☐

(3) Results of the Shock Hazard Analysis: \_\_\_\_\_

☐

(4) Determination of the Shock Protection Boundaries: \_\_\_\_\_

☐

(5) Results of the Arc Flash Hazard Analysis: \_\_\_\_\_

☐

Determination of the Arc Flash Protection Boundary: \_\_\_\_\_

☐

(6) Necessary personnel protective equipment to safely perform the assigned task: \_\_\_\_\_

☐

(7) Means employed to restrict the access of unqualified persons from the work area: \_\_\_\_\_

☐

(8) Evidence of completion of a Job Briefing including discussion of any job – related hazards: \_\_\_\_\_

☐

(10) Do you agree the above described work can be done safely?

☐ Yes☐ No

(If no, return to requester)

**PART III: RECOMMEND APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED:**

\_\_\_\_\_  
**OICC SIGNATURE**

\_\_\_\_\_  
**CI SIGNATURE**

\_\_\_\_\_  
**OPS SIGNATURE**

\_\_\_\_\_  
**NAVFAC MIDLANT CONTRUCTION SAFETY MANAGER**

**PART IV: FINAL APPROVAL:**

\_\_\_\_\_  
**NAVFAC MILANT COMMANDING OFFICER**

**NOTE: COMPLETED FORM WILL BE KEPT ON FILE BY MIDLANT CONSTRUCTION SAFETY MANAGER**

[illegible]

- [illegible]

SECTION 01 45 00.05 20

DESIGN AND CONSTRUCTION QUALITY CONTROL  
05/13

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC (2012) International Building Code

ASTM INTERNATIONAL (ASTM)

ASTM E329 (2014a) Standard Specification for  
Agencies Engaged in the Testing and/or  
Inspection of Materials Used in  
Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008; Errata 2011) Safety and Health  
Requirements Manual

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N (2014) Navy and Marine Corps Design  
Procedures

UFC 1-200-01 (2013) General Building Requirements

1.2 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Design Quality Control (DQC) Plan; G

Submit a DQC Plan prior to the Post Award Kickoff Meeting.

Construction Quality Control (CQC) Plan; G

Submit a Construction QC Plan prior to start of construction.

SD-05 Design Data

Design Quality Control Documentation; G

SD-06 Test Reports

## Acceptance Testing of Critical Systems Checklist

### SD-07 Certificates

Preliminary Inspections and Final Acceptance Testing; G

Final Life Safety/Fire Protection Certification; G

ICC IBC Special Inspections Certification; G

### SD-11 Closeout Submittals

Summary Commissioning Report; G

## 1.3 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program that is administered by a Design and Construction Quality Control organization, using Quality Control (Design and Construction) Plans, Commissioning Plans and Reports, meetings, a Coordination and Mutual Understanding Meeting, three phases of control, submittal review and approval, testing, completion inspections, and QC certifications and documentation necessary to provide design, materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program shall cover on-site and off-site work. No construction work or testing may be performed unless the QC Manager is on the work site.

### 1.3.1 QC Plan Meeting

Prior to submission of the QC Plan, the QC Manager may request a meeting with the Contracting Officer to discuss the QC Plan requirements of this Contract.

The purpose of this meeting is to develop a mutual understanding of the QC Plan requirements prior to plan development and submission and to agree on the Contractor's list of Definable Features of Work (DFOWs).

### 1.3.2 Mutual Understanding Meeting

The purpose of this meeting is to develop a mutual understanding of the QC Plans, including documentation, administration, requirements & procedures, coordination of activities to be performed, and the coordination of the contractor's management, production and QC personnel. At the meeting, the contractor will explain in detail how the three phases of quality control will be implemented for each DFOW.

### 1.3.3 Design and Construction Quality Control Plans

The Contractor shall provide a project specific [Design Quality Control \(DQC\) Plan](#) and [Construction Quality Control \(CQC\) Plan](#), for review and approval by the Contracting Officer. The Contractor shall perform no design until the DQC Plan is approved and no construction until the CQC Plan is approved. The Contractor's plans shall include the following:

- a. The QC organization for this contract, including member resumes.
- b. A letter from an officer of the company designating the QC Manager, Alternate QC Manager, DQC Manager, and their authority.

- c. QC Manager qualifications.
- d. DQC Manager qualifications.
- e. List of **Definable Features of Work (DFOW)** including list of design submittal packaging. DFOW is a task that is separate and distinct from other tasks and has control requirements and work crews unique to the task.
- f. For the CQC Plan. a plan to implement the "Three Phases of Control" for each DFOW.
- g. For the CQC Plan, a testing Plan, log and list of personnel and accredited laboratories that will perform tests. Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation with the testing plan. Coordinate this testing Plan with the Commissioning Plan verification testing requirements to avoid duplication of effort.
- h. Submittal Register including design submittals, listing personnel who will review submittals and noting submittals for Contracting Officer review.
- i. Procedures for submitting and reviewing variations prior to submission to the Contracting Officer.
- j. As a part of the Contractor's CQC plan, a statement of Special Inspections shall be prepared by the Designer of Record (DOR) describing a complete list of materials and work requiring special inspections, the inspections to be performed and any applicable quality assurance plans and structural observations. The Contractor's plan shall implement the applicable requirements of the **UFC 1-200-01, Section 2-17 "Structural Inspections and Test"**. The plan shall include a listing of the individuals, approved agencies or firms that will be retained for conducting the required special inspections accompanied by a description of individual inspector's experience and a copy of all required certifications. Structural tests and special inspections, as outlined in Chapter 17 of the **ICC IBC** shall be conducted by individuals and agents that are under the direct supervision of a Registered Design Professional (RDP) and meet the requirements of **ASTM E329**.
- k. As part of the Contractor's DQC plan, a statement of Life Safety and Fire Protection Features Inspections and Testing shall be prepared by the Fire Protection Designer of Record. Examples of life safety and fire protection features include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as fire rated walls/partitions, through-penetration firestop systems, spray-applied fire proofing of structural components, fire alarm and detection systems, fire suppression and standpipe systems, means of egress components, emergency and exit lighting fixtures. The plan will include a listing of the individuals, approved agencies or firms that will be retained for conducting the required inspections and tests accompanied by a description of individual inspector's experience and a copy of all required certifications. Additional copies of this plan shall be submitted to the **MIDLANT** Fire Protection Engineer and the Installation Fire Chief. This plan shall include the following:

1. Comprehensive list of systems, components or features to be inspected and tested.
  2. Description of performance verification testing activities for each system or component.
  3. Procedures and schedules for functional performance tests of all systems requiring functional testing.
1. For the DQC plan, submit a formal Communication Plan the indicates the frequency of design meetings and what information is covered in those meetings, key design decision points tied to the Network Analysis Scheduled and how the DOR plans to include the Government in those decisions, peer review procedures, interdisciplinary coordination, design review procedures, comment resolution, etc.

The Communication Plan will emphasize key decisions and possible problems the Contractor and Government may encounter during the design phase of the project. Provide a plan to discuss design alternatives and design coordination with the stakeholders at the key decision points as they arise on the project. Identify individual stakeholders and suggested communication methods that will be employed to expedite and facilitate each anticipated critical decision. Communication methods may include: Concept Design Workshop, over-the-shoulder review meetings, presentation at client's office, lifecycle cost analysis presentation, technical phone conversation, and formal review meeting. The design portion of the Communication Plan must to be written by the DQC Manager and confirmed during the Post Award Kick off Partnering. Update the Communication Plan at every Partnering meeting.

- m. For the DQC Plan, procedures for insuring the design documents are submitted in accordance with **FC 1-300-09N NAVY AND MARINE CORPS DESIGN PROCEDURES** and other procedures to ensure disciplines have been properly coordinated to eliminate conflicts.
- n. For the DQC Plan, provide Quality Control Documentation procedures such as QC review sets and QC comments to demonstrate that cross checking of all engineering **disciplines'** design drawings and specifications has taken place. The QC review documentation shall exhibit a checking process of the design documents for completeness, accuracy, and constructability.
- o. For the DQC Plan, a list of design subcontractors and the scope of the work which each firm will accomplish.

#### 1.3.4 **Commissioning Plan**

**Work with the Government Commissioning Authority (CA) in the development of the Commissioning Plan for this project.**

#### 1.4 QC ORGANIZATION

The QC Manager shall manage the QC organization and shall report to an officer of the firm and shall not be subordinate to the Project Superintendent or the Project Manager.



#### 1.4.1 QC and Alternate QC Manager

##### QC and Alternate QC Manager qualifications:

- a. Complete the course entitled "Construction Quality Management (CQM) for Contractors" and maintain a current certificate. The QC Manager that does not have a current certification must obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for class schedule information.
- b. Familiar with requirements of USACE EM 385-1-1, and experience in the areas of hazard identification and safety compliance.
- c. Five years of combined experience as a Superintendent, QC Manager, Project Manager, or Project Engineer on similar size and type construction contracts, and at least two years experience as a QC Manager.

##### QC and Alternate QC Manager responsibilities:

- a. Participate in the Post Award Kick-off, Partnering, Preconstruction, Design Development, and Coordination and Mutual Understanding Meetings.
- b. Implement the "Three Phases of Control" plan for each DFOV and notify the Contracting Officer at least 3 business days in advance of each Preparatory and Initial Phase meeting. Submit respective checklists to the Contracting Officer the next business day.
- c. Ensure that no construction begins before the DOR has finalized the design for that segment of work, and construction submittals are approved as required.
- d. Inspect all work and rework, using International Conference of Building Officials certified QC specialists as applicable, to ensure its compliance with contract requirements. Maintain a rework log.
- e. Immediately stop any segment of work, which does not comply with the contract requirements, and direct the removal and replacement of any defective work.
- f. Remove any individual from the site who fails to perform their work in a skillful, safe and workmanlike manner or whose work does not comply with the contract plans and specifications.
- g. Prepare daily QC Reports.
- h. Ensure that Contractor Production Reports are prepared daily.
- i. Hold bi-weekly QC meetings with the DQC Manager, Commissioning Authority, DOR (or representative), Superintendent and the Contracting Officer; participation shall be suitable for the phase of work. Distribute minutes of these meetings.
- j. Ensure that design and construction submittals are reviewed and approved, as required by the contract, prior to allowing material on site and work to proceed with these items. Maintain a submittal register.

- k. Update As-built drawings daily, maintaining up-to-date set on site.
- l. Maintain a testing plan and log. Ensure that all testing is performed in accordance with the contract. Review all test reports and notify the Contracting Officer of all deficiencies, along with a proposal for corrective action.
- m. Maintain rework log on site, noting dates deficiency identified, and date corrected.
- n. Certify and sign statement on each invoice that all work to be paid under the invoice has been completed in accordance with contract requirements.
- o. Perform Punch-out and participate in Pre-final and Final acceptance Inspections. Submit list of deficiencies to the Contracting Officer for each inspection. Correct all deficiencies prior to the Final inspection. Notify Contracting Officer prior to final inspection to establish a schedule date acceptable by the Contracting Officer.
- p. Ensure that all required keys, operation and maintenance manuals, warranty certificates, and the As-built drawings are correct and complete, in accordance with the contract, and submitted to the Contracting Officer.
- q. Assure that all applicable tests, special inspections, and observations required by the contract are performed.
- r. Coordinate all factory and on-site testing, Testing Laboratory personnel, QC Specialists, and any other inspection and testing personnel required by this Contract.
- s. Notify the Contracting Officer of any proposed changes to the QC plan.
- t. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.
- u. Update the Performance Assessment Plan as described in **Section 01 31 19.05 20 POST AWARD MEETINGS** and discuss monthly at a QC meeting.

#### 1.4.2 DQC Manager

The DQC Manager shall be a member of the QC organization, shall coordinate actions with the QC Manager, and shall not be subordinate to the Project Superintendent or the Project Manager.

DQC Manager qualifications:

- a. A minimum of 5 years experience as a design Architect or Engineer on similar size and type designs /or design-build contracts. Provide education, experience, and management capabilities on similar size and type contracts.
- b. Be a registered professional engineer or architect with an active registration. Provide proof of registration as part of the resume submittal package.
- c. Complete the course entitled "Construction Quality Management (CQM) for

Contractors."

DQC Manager responsibilities:

- a. Be responsible for the design integrity, professional design standards, and all design services required.
- b. Be a member of the Designer of Record's (DOR) firm.
- c. Be responsible for development of the design portion of the QC Plan, incorporation and maintenance of the approved Design Schedule, and the preparation of DQC Reports and minutes of all design meetings.
- d. Participate in the Post Award Kick-Off, all design planning meetings, design presentations, partnering, and QC meetings.
- e. Implement the DQC plan and shall remain on staff involved with the project until completion of the project.
- f. Be cognizant of and assure that all design documents on the project have been developed in accordance with the Contract.
- g. Provide [Design Quality Control Documentation](#) (DQCD) which indicates design coordination of the engineering disciplines. Submit DQCD with the prefinal and final design submittals as required in Section [01 33 10.05 20](#) DESIGN SUBMITTAL PROCEDURES.
- h. Develop the submittal register. Coordinate with each DOR to determine what items need to be submitted, and who needs to approve.
- i. Provide QC certification for design compliance.
- j. Certify and sign statement on each invoice that all work to be paid to the DOR under the invoice has been completed in accordance with the contract requirements.
- k. Prepare weekly DQC Reports that documents the work the design team accomplished that week.
- l. Coordinate all training requirements with the QC and the eOMSI Preparer.

#### 1.4.3 QC Specialists

QC Specialists shall assist and report to the QC Manager and may perform production related duties but must be allowed sufficient time to perform their assigned quality control duties. QC Specialists are required to attend the Coordination and Mutual Understanding Meeting, QC meetings and be physically present at the construction site to perform the three phases of control and prepare documentation for each definable feature of work in their area of responsibility at the frequency specified below.

##### 1.4.3.1 Fire Protection QC Specialist

The Fire Protection QC Specialist (FPQC) shall be a U.S. Registered Professional Engineer and shall be an integral part of the Prime Contractor's Quality Control Organization. This FPQC shall have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any fire protection equipment device manufacturers, suppliers or installers for any such equipment

provided as part of this project. The Fire Protection Designer of Record may serve as the lead Fire Protection QC Specialist, provided the following qualifications are met.

- a. **Qualifications/Experience:** The FPQC shall have obtained their professional registration by successfully completing the Fire Protection Engineering discipline examination. This FPQC shall have a minimum of 5 years full time and exclusive experience in every aspect of facility design and construction as it relates to fire protection, which includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, passive fire protection design, water supply analysis, and a multi-discipline coordination reviews, and construction surveillance.
- b. **Area of Responsibility:** The FPQC is responsible for assuring the proper construction and installation of life safety and fire protection features across all disciplines and trades. The FPQC shall be responsible for assuring that life safety and fire protection features are provided in accordance with the design documents, approved construction submittals, and manufacturer's requirements. Examples include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as spray-applied fire proofing of structural components and fire rated walls/partitions, fire alarm and detection systems, fire suppression and standpipe systems, emergency and exit lighting fixtures, etc.
- c. **Construction Surveillance:** The FPQC is responsible for reviewing and implementing the QC Plan developed by the Fire Protection DOR. The FPQC shall visit the construction site as necessary to ensure life safety and fire protection systems are being constructed, applied, and installed in accordance with the approved design documents, approved construction submittals, and manufacturer's requirements. Frequency and duration of the field visits are dependent upon particular system components, system complexity, and phase of construction. At a minimum, field visits shall occur just prior to installation of suspended ceiling system to inspect the integrity of passive fire protection features and fire suppression system piping, and required performance verification testing of all life safety and fire protection systems identified below and in Part 4.
  1. **Preliminary Inspections and Final Acceptance Testing:** FPQC shall personally witness all preliminary inspections of fire alarm/detection and suppression systems. Once preliminary inspections have been successfully completed, the FPQC shall submit a signed certificate to the QC Manager that systems are ready for final inspection and testing. The Naval Facilities Engineering Command Fire Protection Engineer will witness formal tests and approve all systems before they are accepted. The QC Manager shall submit the request for formal inspection at least 15 days prior to the date the inspection is to take place. The QC manager shall provide 10 days advance notice to the Contracting Officer and the activity Fire Inspection Office of scheduled final inspections.
- d. **QC Documentation and Certifications:** The following documentation and certification shall be prepared by the FPQC. Additional copies shall be submitted to the MIDLANT Fire Protection Engineer and the Installation Fire Chief.

1. Field visit reports. Submit reports documenting all field visits and summarizing all findings.
2. Inspection and Test reports and certificates. Submit in accordance with the applicable codes, standards, and this RFP.
3. **Final Life Safety/Fire Protection Certification.** The FPQC shall provide certification that all life safety and fire protection systems have been inspected and in the FPQC's professional judgment, have been installed in accordance with the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features, and shall bear the professional seal of the fire protection engineer.

#### 1.4.3.2 Mechanical QC Specialist

Provide **ICC IBC Special Inspections Certification** from the following specialist(s):

<u>Qualification/Experience in Area of Responsibility</u>	<u>Area of Responsibility</u>	<u>Frequency</u>
Plumbing Inspector International Conference of Building Officials (ICBO) Certified / 5 Years Minimum	Installation and Testing of Rainwater Reclamation System	Minimum 2 times a week during installation and full-time during testing
Registered Mechanical Engineer (PE)/ QC Specialist	Testing of Installed Mechanical Systems	Full time during testing and TABs

#### 1.4.3.3 Soils Testing/Pile Installation and Testing QC Specialists

Provide **ICC IBC Special Inspections Certification** from the following specialist(s):

<u>Qualification/Experience in Area of Responsibility</u>	<u>Area of Responsibility</u>	<u>Frequency</u>
Registered Engineer (PE) or under the supervision of a (PE)	Soil testing, Pile Installation and Testing	As required in <b>ICC IBC Chapter 17</b>

#### 1.4.3.4 Structural QC Specialists

Provide **ICC IBC Special Inspections Certification** from the following specialist(s):

<u>Qualification/Experience in Area of Responsibility</u>	<u>Area of Responsibility</u>	<u>Frequency</u>
Registered Engineer (PE) or under the supervision of a (PE)	As required by UFC 1-200-01 Section 2-17 Structural Inspections and Tests	As required by UFC 1-200-01 Section 2-17 Structural Inspections and Tests

#### 1.4.3.5 Building Envelope QC Specialist

Provide ICC IBC Special Inspections Certification from the following specialist(s):

<u>Qualification/Experience in Area of Responsibility</u>	<u>Area of Responsibility</u>	<u>Frequency</u>
Roofing Manufacturer's Technical Representative/ 5 years minimum with roofing system used.	Installation and Testing of Roofing	Once a week during installation, two times a week during flashing installation and full time during roof testing

#### 1.4.3.6 Electrical and Telecommunications Systems QC Specialists

Provide ICC IBC Special Inspections Certification from the following specialist(s):

<u>Qualification/Experience in Area of Responsibility</u>	<u>Area of Responsibility</u>	<u>Frequency</u>
Electrical Inspector Crew supervision for 10 years minimum Master Electrician licensed in South Carolina	Electrical Systems, All Division 26 Sections, and Division 33 Elec. Sections	Full time during installation and testing all systems
Telecommunications Systems Installation Specialist 10 years minimum experience in telecom- munications systems installation	Telecommunications Systems, All Division 27, 28 Sections and Division 33 Outside Plant (OSP) work	Full time during systems installation and testing

#### 1.5 THREE PHASES OF CONTROL

The Three Phases of Control shall adequately cover both on-site and off-site work and shall include the following for each DFOV.

##### 1.5.1 Preparatory Phase

Notify the Contracting Officer at least two work days in advance of each preparatory phase meeting. The meeting shall be conducted by the QC Manager and attended by the Project Superintendent, QC Specialists, and the foreman responsible for the DFOV. The DQC Manager shall also attend if required by structural tests and special inspections, as outlined in Chapter 17 of the ICC IBC and the DQC Plan. When the DFOV will be accomplished by a subcontractor, that subcontractor's foreman shall attend the preparatory phase meeting. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each DFOV:

- a. Review each paragraph of the applicable specification sections;
- b. Review the Contract drawings;

- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. Examine the work area to ensure that the required preliminary work has been completed;
- f. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;
- g. Discuss the specific controls used in construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW; and
- h. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.

#### 1.5.2 Initial Phase

Notify the Contracting Officer at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with Project Superintendent, the QC Specialists, and the foreman responsible for that DFOW. The DQC Manager shall also attend if required by structural tests and special inspections, as outlined in Chapter 17 of the **ICC IBC** and the DQC Plan. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the **daily CQC Report and in the Initial Phase Checklist**. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DFOW:

- a. Establish the quality of workmanship required;
- b. Resolve conflicts;
- c. Ensure that testing is performed by the approved laboratory, and
- d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.
- e. Ensure manufacturer's representative has performed necessary inspections, if required.

#### 1.5.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFOW and document in the daily CQC Report:

- a. Ensure the work is in compliance with Contract requirements;
- b. Maintain the quality of workmanship required;

- c. Ensure that testing is performed by the approved laboratory; and
- d. Ensure that rework items are being corrected.

#### 1.5.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW is resumed after substantial period of inactivity, or if other problems develop.

#### 1.5.5 Notification of Three Phases of Control for Off-Site Work

Notify the Contracting Officer at least two weeks prior to the start of the preparatory and initial phases.

### 1.6 COMPLETION INSPECTIONS

The Contractor shall perform the necessary **Punch-Out, Pre-Final, and Final** inspections, compile **punch lists**, and correct deficiencies.

#### 1.6.1 Punch-Out Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager and the CA must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications and Contract. Include in the punch list any remaining items on the "Rework Items List" which were not corrected prior to the Punch-Out Inspection. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer. The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Contracting Officer that the facility is ready for the Government "Pre-Final Inspection".

#### 1.6.2 Pre-Final Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager and the CA must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications and Contract. Include in the punch list any remaining items on the "Rework Items List", which were not corrected prior to the **Pre-Final Inspection**. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer. The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Contracting Officer that the facility is ready for the Government "**Final Acceptance Inspection**".

#### 1.6.3 Final Acceptance Inspection

Notify the Contracting Officer at least 14 calendar days prior to the date a Final Acceptance Inspection can be held. State within the notice that all items previously identified on the pre-final punch list will be



corrected and acceptable, along with any other unfinished Contract work, by the date of the Final Acceptance Inspection. The Contractor must be represented by the QC Manager, the Project Superintendent, the CA, and others deemed necessary. Attendees for the Government will include the Contracting Officer, other OICC/ROICC personnel, and personnel representing the Client. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "Inspection of Construction."

#### 1.7 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities.

#### PART 2 PRODUCTS

Not used.

#### PART 3 EXECUTION

Not used.

-- End of Section --

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# ENGINEERING & CONSTRUCTION Bulletin

Issue No. 2008-03

25 September 2008

Type: Policy

Subject: **Acceptance Testing of Critical Systems**

Reference: (a) ECB 2007-01 Proper use of Military Construction Funds, 13 October 2006

Enclosure: (1) Roles and Responsibilities (R&R) Matrices

Cancelled: NAVFAC Instruction 12271.1: NAVFAC Total Building Commissioning Policy, dated 23 October 2003

## 1. Purpose.

To focus NAVFAC's technical oversight of acceptance testing during construction on five critical areas (electrical, fire and life safety, mechanical, roofing, and underwater structures) to ensure the constructed facility performs as intended and meets the needs of the supported commands; to define the use of Post Construction Award Services (PCAS) funding as it applies to the Capital Improvements Business Line (CIBL) in-house acceptance testing and technical support efforts.

## 2. Background.

NAVFAC has identified five critical areas that have consistently caused problems in facilities delivered to its supported commands. These areas are electrical, fire and life safety, mechanical, roofing systems, and underwater structures. These five critical areas were identified as requiring ongoing, thorough construction technical oversight in support of acceptance testing. A NAVFAC Team of technical experts determined how to apply responsible oversight to these five critical areas using one-half of PCAS funds. Each Team compiled all systems / sub-systems and developed R&R matrices (enclosure (1)). Each matrix identifies responsibilities of each of the contributors to the quality and functionality of the completed project, including the contractor, Facilities Engineering Command's (FEC) Integrated Product Team (IPT) and Facilities Engineering and Acquisition Division (FEAD) technical staff. The matrices served as the basis for determining the level of effort (man hours) to perform the technical support for acceptance testing. The following table shows the format in the R&R matrices. Each heading is provided with a description of each column's intent:

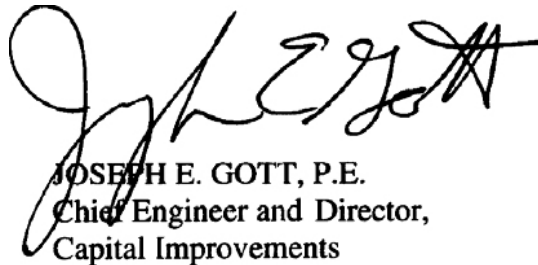
System	Sub-System	Phase	Element	Ktr QC-DOR (Project Req'ts)	FEAD (SIOH)	FEC (PCAS)
Major system grouping	Specific system	Phase of the project where it will occur	The item or task to be accomplished	What actions, if any, need to be taken by the appropriate party? (Indicates funding method)		

The contractor is still responsible for delivering a high quality and properly functioning facility via the Contractor Quality Control (CQC) program and commissioning process (including documentation and training).

### **3. Policy and Implementation.**

The following will apply to the performance of acceptance testing for the five critical areas:

- a. This applies to Military Construction (MILCON) and all Special Projects with costs over \$750,000 for design-build and design-bid-build contracts.
- b. The Project Manager (PM) shall manage, in coordination with the Construction Manager (CM), the project PCAS funds. The PM shall ensure that PCAS funding is used in accordance with reference (a).
- c. The average funds available to support the CIBL acceptance testing in-house effort will be one-half the total PCAS funds.
- d. Enclosure (1) defines the roles and responsibilities of the contractor, FEC's IPT and FEAD technical staff.
- e. While the FEAD will be responsible for managing the overall construction project, the FEC's IPT will be responsible for the technical support for the acceptance testing effort associated with the five critical areas. Technical support from the FEAD can be leveraged as capabilities and resources allow, and must be coordinated between the FEC IPT and FEAD. The support for the five critical areas will be provided by engineers that have been trained and are experienced in that area.
- f. The CM will manage the day-to-day coordination with the contractor and coordinate the necessary reach back to the FEC IPT for technical support for acceptance testing.
- g. PCAS must be budgeted and included in the project costs. The PCAS costs must be shown in the budget estimate summary sheets (BESS) on the DD 1391.
- h. The Public Works Business Line (PWBL) has agreed to designate representatives who are responsible for facility maintenance and sustainment to perform the following:
  - i. Participate in the submittal review process by providing comments on submittals for the critical areas.
  - ii. Be present for the final inspections and tests.
  - iii. Be present for all system training.
  - iv. Provide feedback and lessons learned to the FEC CI4.
- i. It is recommended that the designated representatives, who are responsible for maintenance and sustainment visit the site during construction to become familiar with the building systems.
- j. The efforts in paragraph 3.h above will not be funded using PCAS or supervision, inspection and overhead (SIOH).



**JOSEPH E. GOTT, P.E.**  
Chief Engineer and Director,  
Capital Improvements

Note: This ECB has been coordinated with Headquarters, U.S. Marine Corps (Code LFF).

# ELECTRICAL ENGINEERING ROLES and RESPONSIBILITIES

<i>System</i>	<i>Sub-Systems</i>	<i>Phase</i>	<i>Elements</i>	<i>EE QC / DOR (Ktr)</i>	<i>FEAD (SIOH)</i>	<i>FEC (PCAS)</i>
<b>All Systems</b>	<b>Submittals &amp; Plans</b>	Pre-Construction	Qualifications of Installer, Shop Drawings, Data Sheets, and Calculations (as applicable)	A	C	S
			QC Plan		A	S
			Performance Verification Plan		A	S
	<b>Certificates &amp; Reports</b>	Construction	Functional Acceptance Test Procedure	A	C	S
			Preliminary Test Reports	A	RA	S
			Final Acceptance Test Reports	A	C	S
<b>Power Generators</b>	<b>Single Operation Generator Sets</b>	Test Preparation	Perform fuel oil piping tests	V	C	-
			Perform acceptance checks and tests	V	W	C
			Perform preliminary operations	V	W	C
		Final Test	Test all engine protective shutdown devices	V	—	W
			Test all pre-shutdown alarm devices	V	—	W
			Test crank cycle/terminate relay	V	—	W
			Test automatic and manual operations in all possible scenarios involving loss of utility, return of utility, manual starting, and emergency stop	V	—	W
			Perform load test	V	—	W
	<b>Automatic Transfer Switches</b>	Test Preparation	Perform acceptance checks and tests	V	W	C
		Final Test	Simulate loss of normal power	—	—	W
			Simulate return of normal power	V	—	W
			Simulate loss of emergency power	V	—	W
			Simulate all forms of single-phase conditions	V	—	W
			Verify operation of normal power voltage-sensing relays	V	—	W
			Verify engine start sequence	V	—	W
			Verify time delay upon transfer	V	—	W
			Verify operation of alternate power voltage-sensing relays	V	—	W
			Verify automatic transfer operation	V	—	W
			Verify interlocks and limit switch operation	V	—	W
			Verify time delay and retransfer upon normal power	V	—	W
<b>400-Hertz Solid State Frequency Converter</b>	<b>All</b>	Test Preparation	Perform acceptance checks and tests	V	W	C
			Verify equipment nameplate information with specifications and approved shop drawings	V	W	—
			Inspect physical and mechanical condition	V	W	—
			Verify correct equipment grounding	V	W	—
			Perform resistance measurements through all bolted connections	V	W	—
			Perform preliminary operations	V	W	C
		Final Test	Test all control devices	V	—	W
			Test all protective shutdown devices	V	—	W
			Perform load test	V	—	W
			Perform transient tests	V	—	W
			Perform harmonic distortion tests	V	—	W
			Perform automatic line drop compensation test	V	—	W

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# ELECTRICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	EE QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Uninterruptible Power Supply (UPS)	All	Test Preparation	Verify ventilation equipment in UPS and battery rooms are operational	V	W	—
			Verify battery cells are filled with electrolyte	V	W	—
			Verify polarity of DC connections and phase rotation of AC connections	V	W	—
			Verify AC power to all equipment	V	W	—
			Verify remote monitors and control wiring	V	W	—
			Verify UPS system and battery system is properly grounded	V	W	—
			Verify operation of emergency shower and eye wash	V	W	—
			Verify control connections between UPS and emergency engine generator signal contacts	V	W	—
			Verify control connections between UPS module and UPS maintenance bypass cabinet	V	W	—
			Perform acceptance checks and tests	V	W	C
		Final Test	Perform load tests	V	—	W
			Perform full-load burn in test	V	—	W
			Perform battery discharge test	V	—	W
			Perform battery performance test	V	—	W
			Perform UPS in conjunction with emergency generator service (if applicable)	V	—	W
Lighting	Interior Lighting	Final Test	Verify electronic dimming ballasts operation over full range of dimming capability without any visually detectable flicker	V	W	—
			Verify occupancy sensors operation	V	W	—
			Verify lighting controls operation	V	W	—
			Verify lighting output levels	V	W	—
	Exterior Lighting	Final Test	Verify photocell aiming and operation	V	W	—
			Verify lighting controls operation	V	W	—
Transformers	Single-Phase Pad-Mounted Transformers	Factory Routine Tests	Perform resistance measurements, polarity, ratio, no-load losses and excitation current, load losses and impedance voltage, dielectric, leak (liquid-filled), and dissolved gas analysis (liquid-filled) tests	—	—	W
		Field Tests	Perform acceptance checks and tests	V	W	C
	Three-Phase Pad-Mounted Transformers	Factory Routine Tests	Perform resistance measurements, polarity, ratio, no-load losses and excitation current, load losses and impedance voltage, dielectric, leak (liquid-filled), and dissolved gas analysis (liquid-filled) tests	—	—	W
		Field Tests	Perform acceptance checks and tests	V	W	C
	Secondary Unit Substations	Factory Routine Tests	Perform resistance measurements, polarity, ratio, no-load losses and excitation current, load losses and impedance voltage, and dielectric tests	—	—	W
		Field Tests	Perform acceptance checks and tests	V	W	C
	Primary Unit Substations	Factory Routine Tests	Perform resistance measurements, polarity, ratio, no-load losses and excitation current, load losses and impedance voltage, dielectric, leak (liquid-filled), and dissolved gas analysis (liquid-filled) tests	—	—	W
		Field Tests	Perform acceptance checks and tests	V	W	C

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# ELECTRICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>EE QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Switchgear / Switchboards</b>	<b>Metal-Clad Switchgear / Switchboards and Busway</b>	Factory Production Tests	60 Hz dielectric, mechanical operation, electrical operation and control wiring, and ground fault sensing equipment tests	—	—	W
		Test Preparation	Perform acceptance checks and tests	V	W	C
<b>Cable</b>	<b>Medium-Voltage Cable, Terminations, and Splices</b>	Test Preparation	Perform acceptance checks and tests	V	W	—
		Field Tests	Perform shield continuity and very low frequency (VLF) tests	V	W	—
<b>SF6 Switch - Padmount</b>	<b>Medium Voltage Pad-mounted Switches</b>	Factory Production Tests	60 Hz dielectric, mechanical operation, electrical operation and control wiring, and ground fault sensing equipment tests	—	—	W
		Test Preparation	Perform acceptance checks and tests	V	W	C
<b>Airfield Lighting</b>	<b>Airfield Lighting Circuits</b>	Field Tests	Airfield lighting circuits low voltage continuity and high voltage insulation resistance tests	V	W	—
		Field Tests	Airfield lighting circuit operating test	V	W	—
	<b>Counterpoise</b>	Field Tests	Counterpoise system test	V	W	—
	<b>Constant</b>	Field Tests	Perform open circuit protector and load tests	V	W	—
	<b>All</b>	Field Tests	Perform airfield lighting system operation test	V	W	—
<b>Cathodic Protection</b>	<b>Cathodic Protection by Galvanic Anodes</b>	Field Tests	Perform non-destructive testing of anodes	V	W	—
			Perform destructive testing of anodes	V	W	—
			Perform base potential tests, insulation joint testing, electrical continuity testing, pipe casing testing, anode-to-soil potential tests, anode output tests, protected potential measurement tests, and interference testing.	V	W	—
			Perform field operation tests.	V	—	W
	<b>Cathodic Protection by Impressed Current</b>	Field Tests	Perform non-destructive testing of anodes	V	W	—
			Perform destructive testing of anodes	V	W	—
			Perform base potential tests, permanent reference electrode calibration, insulation joint testing, electrical continuity testing, rectifier system testing, pipe casing testing, protected potential measurement tests, and interference testing.	V	W	—
			Perform field operation tests.	V	—	W

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# FIRE PROTECTION ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>FP QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>All Systems</b>	<b>Required Submittals</b>	Test Prep & Preliminary Certifications	QC Plan	—	A	S
			Performance Verification Plan	—	A	S
			Field Visit/Construction Surveillance Reports	—	S	QA
			Final Acceptance Test Reports	A	S	QA or A
			Final Life Safety/Fire Protection Certification	—	S	A
<b>Sprinkler Systems</b>	<b>Wet Pipe Sprinkler Systems</b>	Test Preparation	Process/review system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Process/review Preliminary Test Reports & Certifications	—	RA	S
			Witness hydrostatic test.	A	C	—
			Witness flush test.	V	W	—
			Visually inspect system for adherence to plan, completeness, and adequacy of installation.	A	QA	QA
			Visually inspect pipe penetrations	A	QA	QA
			Visually inspect sprinklers for location and that they are not painted / taped.	A	QA	QA
			Visually inspect seismic bracing	A	C	QA
			Operate control valves {Other than main service entrance riser}	A	C	QA
			Visually inspect check valve installation	A	C	QA
			Visually inspect test/drain discharge locations	A	C	QA
			Witness backflow preventer forward-flow test (NFPA 13, §16.2.5).	V	W	W
			Inspect/test alarm valve assembly and water service entrance(pipe sleeves, thrust rods, etc.), including valves, flow switch & tamper switches)	V	C	W
			Inspect/test flow control valve assembly	V	C	W
	<b>Additional requirements for Dry Pipe, Preaction - Deluge</b>	Final Test	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Witness hydrostatic test.	A	C	—
			Witness flush test.	V	W	—
			Verify Low-point drains are provided	V	—	QA
			Visually inspect air supply and piping	A	S	QA
			Witness backflow preventer test.	V	W	W
			Test high-low pressure air switch operation	V	—	W
			Inspect/Test deluge or dry valve riser assembly (including control valves, alarm switch & tamper switches), and functional operation	A	S	W
			Inspect/test detection and releasing system	See Fire Alarm System		

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## FIRE PROTECTION ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>FP QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Water Distribution</b>	<b>Fire hydrants, distribution piping, &amp; control valves</b>	Final Test	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	—
			Preliminary Test Reports & Certifications	—	RA	S
			Visually inspect all thrust blocks.	A	QA	—
			Witness hydrostatic test.	A	C	—
			Witness flush testing of hydrant	A	C	QA
			Operate all control/isolation valves (each)	V	S	QA
			Operate fire hydrants and check for proper drainage (each)	V	S	QA
	<b>Water storage</b>	Construction	Preliminary Test Reports & Certifications	—	RA	S
			Verify suction piping w/in tank is installed in accordance with design	A	C	S
<b>Pumps for Fire Protection (Water &amp; Foam)</b>	<b>Pumps &amp; Controllers</b>	Test Preparation	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
		Test Preparation	Visually inspect system for adherence to plan, completeness, and adequacy of installation.	A	QA	QA
			Witness pump controller functional tests (including automatic transfer switch operation & battery transfer as applicable).	A	QA	W
		Final Test	Witness flow test to generate performance curve (pressure vs discharge, rpms, amps, shaft alignment)	V	QA	W
			Witness automatic and manual starts & stops	V	QA	W
			Verify that controller supervisory signals are received by the fire alarm control panel	V	C	W

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# FIRE PROTECTION ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>FP QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Fire Alarm Systems</b>	<b>Evacuation / Notification Detection &amp; Releasing Systems.</b>	<b>Test Preparation &amp; Final Test</b>	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Visually inspect system for adherence to plan, completeness, and adequacy of installation. (30,000 SQ. FT.)	A	QA	QA
			Test initiating devices for proper operation. (Activate 15% of smoke or heat detectors with no failures {30,000 sq. ft.}/(625 sq. ft/ detector)(0.15)=7}	A	QA	QA
			Test initiating circuits for shorts, ground faults, and general operation	A	C	QA
			Test signaling circuits for shorts, ground faults, and general operation	A	C	QA
			Verify audible and visual devices operate properly and audible devices can be heard throughout the facility	A	C	QA
			Test peripheral devices (door hold opens, etc)	A	C	QA
			Witness functional test of the main control panel	V	C	W
			Test interface with other systems (i.e., preaction, gaseous, etc.)	V	C	W
			Test that correct signals are being sent to the base receiving station	V	C	W
			Test recall for elevators - See "Others - Elevators" {Bldg 2 stories or more}	V	S	W
			Test AHU shut down - See "Others - HVAC"	V	S	W
			Test power shut down - See "Others - {Elevators} Electrical"	V	C	W
	<b>Control Panels used for Releasing Service</b>		Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Test releasing circuits for shorts, ground faults, and general operation	V	C	W
			Test power shut down - See "Others - Electrical"	V	S	QA
			Test automatic closing of dampers/doors	V	S	W
	<b>Base-Wide Fire Reporting System</b>		Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Test transmitting devices to ensure the signals are received at the main console {per bldg}	V	C	W
			Test the main console for redundancy requirements	V	S	W

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# FIRE PROTECTION ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	FP QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Miscellaneous Extinguishing Systems	Gaseous Systems	Final Test	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Visually inspect system for adherence to plan, completeness, and adequacy of installation.	A	S	QA
			Verify correct nozzles were installed	A	S	W
			Witness room pressurization test	V	S	W
			Witness full functional test to verify cylinder head functions properly and all control/interface functions operate accordingly.	V	S	W
			Inspect/test detection and releasing system	See Fire Alarm System		
	Wet Chemical & Dry Chemical Systems	Test Prep	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Verify piping and nozzles are installed in accordance with manufacturer's listing requirements	A	S	W
			Witness discharge test - ensure nozzles are bagged if discharging water in a wet chemical system	V	S	W
		Final Test	Verify alarm and supervisory signals are sent to the FACP	V	S	W
			Verify power and gas are disconnect when system activates (if applicable)	V	S	W
			Verify exhaust system either continues to run or shuts down depending on listing (if applicable)	V	S	W
			Inspect/test detection and releasing system	See Fire Alarm System		
	Foam Systems (All types)	Test Preparation	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Review test plan	—	C	QA
			Review the contractor's test plan for environmental and other compliance	—	S	QA
			Inspect/test detection and releasing system	See Fire Alarm System		
			Visually inspect system for adherence to plan, completeness, and adequacy of installation. Conduct functional test of entire system. Submit report.	A	QA	QA
		Final Test	Verify correct foam generators / discharge devices are installed and properly piped	A	—	QA
			Verify correct size pipe and installed properly	A	—	QA
			Verify riser assembly (deluge valve) is installed properly	A	—	QA
		Final Test	Verify strainer has proper mesh	V	QA	W
			Conduct performance test to ensure proper setting and operation of foam control valves and discharge devices. (multiply by the number of risers)	V	QA	W
			Conduct functional test of each generator, ratio controller, or proportioner. (multiply by the number of risers)	—	QA	W

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# FIRE PROTECTION ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>FP QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Passive</b>	<b>Fire / Smoke Barriers IBC Inspections (Section 109)</b>	Preliminary and Final Inspections	Process system submittal (Qualifications of Installer, Shop Drawings, Data Sheets & Calcs)	A	C	S
			Preliminary Test Reports & Certifications	—	RA	S
			Inspect Lath & gypsum board installation	A	QA	QA
			Inspect fire-rated / smoke wall and/or floor penetrations	A	S	QA
			Inspect wall/ceiling/roof joint	A	S	QA
			Inspect/test fire & smoke damper installation and performance	A	S	QA
			Inspect fire doors and frames	A	QA	QA
<b>Life Safety Features</b>	<b>Exit Signs and Emergency Lighting</b>	Preliminary	Verify installed locations of exit signs.	A	S	QA
			Verify installed locations of emergency lighting	A	S	QA
		Final Test	Check performance of emergency lighting systems and battery back-up.	A	S	QA
	<b>Emergency Generators</b>		Check to ensure all life safety features on the emergency generator are provide with power in the required amount of time	A	S	QA
<b>Other Systems</b>	<b>Elevators</b>	Test	Verify elevator re-call to primary floor	A	S	QA
			Verify elevator re-call to alternate floor	A	S	QA
			Test power disconnect upon water flow	V	S	QA
			Verify signal in elevator cab activates	V	S	QA
	<b>Smoke Control / Exhaust Systems</b>	Preliminary Test	Verify smoke exhaust / smoke control system activates via appropriate initiating devices (IBC §1704)	A	S	QA
			Verify location of duct detectors and for proper installation	A	S	QA
		Final Test	Perform operational test to show smoke exhaust / smoke control system functions as designed	V	S	QA
			Special Inspections for smoke control (IBC §1704) (See NFPA 92A & 92B, Chap. 8.)	A	W	W
			Perform operational test to verify detector functions properly and shuts down the correct AHU	V	S	QA
	<b>Electrical</b>	Pre-Test	Verify each detector associated with the electrical equipment disconnects power	A	S	QA
		Final Test	Test power disconnect for associated electronic equipment	V	S	QA

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Energy Supply Systems	Fuel Oil - ALL	Field Visit	<b>Complete System</b> - Verify contractor provided complete fuel oil system to the facility, including applications and permits	A	QA	—
			<b>Piping</b> - Verify fuel oil piping meets requirements of International Mechanical Code.	A	QA	—
			<b>Testing</b> - Verify oil system testing meets requirements of NFPA 31.	V	W	—
	Fuel Oil - Exterior	Submittal Process	<b>Piping</b> - Verify fuel piping is either ASTM A 53 Type E (electric-resistance welded, Grade A or B) black steel; or ASTM A 53 Type S (seamless, Grade A or B) black steel; or API SPEC 5L, seamless, submerged-arc weld or gas metal-arc weld, Grade B, black ste	A	RA	—
			<b>Fuel Pumps</b> - Verify fuel pumps comply with NEMA MG 1, NFPA 70, and are designed for use with hydrocarbon fuels.	A	RA	—
			<b>Fuel Pumps</b> - Verify fuel pumps have a working pressure of 1896 kilopascals (275 psig) at 38 degrees C (100 degrees F).	A	RA	—
			<b>Fuel Meters</b> - Verify fuel meters are continuous duty, positive displacement type, with electronic thermal compensation capability, suitable for outdoor installation.	A	RA	—
			<b>Fuel Meters</b> - Verify fuel meters are designed for use with hydrocarbon fuels and have a working pressure of 1896 kilopascals (275 psig) at 38 degrees C (100 degrees F).	A	RA	—
		Submittal Process/ Field Visit	<b>Storage Tanks</b> - Verify aboveground liquid fuel storage tanks are concrete encased or double wall in accordance with UL 142 and UL 2085 with secondary containment and leak monitoring of a capacity to meet the system requirements. Verify overflow/spill con	A	RA/ QA	S
			<b>Dispensing Tanks</b> - Verify Liquid fuel dispensing tanks are concrete encased or double wall in accordance with UL 142 and UL 2085 with secondary containment and leak monitoring of a capacity to meet the system requirements. Verify overflow/spill containme	A	RA/ QA	S
	Fuel Oil - Interior	Submittal Process	<b>Pumps</b> - Verify pumps that are not part of the burner assembly are positive displacement type	A	RA	—
		Field Visit	<b>Oil Filter</b> - Verify an oil filter is provided prior to oil entering appliance or pump.	A	QA	QA
		Field Visit	<b>Drip Legs</b> - Verify drip legs are provided and properly installed prior to oil entering appliance or pump.	A	QA	—
		Submittal Process	<b>Storage Tanks</b> - Verify all storage tanks meet NFPA 31 requirements.	A	RA	—
	Natural Gas - ALL	Field Visit	<b>Complete System</b> - Verify contractor provided complete natural gas system to the facility, including applications and permits	A	QA	—
		Field Visit	<b>Testing</b> - Verify system was tested at 1.5 times maximum working pressure, but not less than 350 kPa (50 PSI) per NFPA 54	V	W	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Energy Supply Systems (continued)</b>	<b>Natural Gas - Exterior (Contractor installed piping)</b>	Field Visit	<b>Piping</b> - Verify exterior gas piping meets requirements of local natural gas utility	A	QA	—
		Submittal Process	<b>Piping</b> - Verify piping meets requirements of ASME B31.8, Gas Transmission and Distribution Piping Systems	A	RA	—
		Submittal Process	<b>Piping</b> - Verify the natural gas piping is either ASTM A 53, Type E (electric-resistance welded, Grade A or B) black steel piping or ASTM A 53 Type S (seamless, Grade A or B) black steel piping or ASTM D 2513, Grade PE2406 or PE3408 polyethylene piping an	A	RA	—
		Field Visit	<b>Meter and Pressure Regulator</b> - Verify meter and pressure regulator are provided in accordance with local utility requirements.	A	QA	—
		Field Visit	<b>Piping Identification</b> - Verify polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines are provided for non-metallic underground piping systems	A	QA	—
	<b>Natural Gas - Interior</b>	Submittal Process	<b>Piping</b> - Verify interior gas piping meets requirements of NFPA 54, National Fuel Gas Code	A	RA	—
	<b>Propane - ALL</b>	Field Visit	<b>Complete System</b> - Verify contractor provided complete propane system to the facility, including appropriate applications and permits.	A	QA	—
	<b>Propane - Exterior</b>	Submittal Process	<b>Piping</b> - If piping is not provided by propane supplier, verify the propane piping is either ASTM A 53, Type E (electric-resistance welded, Grade A or B) black steel piping or ASTM A 53 Type S (seamless, Grade A or B) black steel piping or ASTM D 2513, Gr	A	RA	—
		Submittal Process	<b>Fittings</b> - Confirm Polyethylene fittings meet ASTM D 2683 for socket fittings or ASTM D 2513 for molded butt-fusion fittings	A	RA	—
		Field Visit	<b>Tank</b> - Verify propane tank capacity conforms to tank capacity submitted in shop drawings.	A	QA	—
		Submittal Process	<b>Tank</b> - If tank is not provided by propane supplier, verify propane tank material and installation comply with NFPA 58.	A	RA	—
		Submittal Process	<b>Tank</b> - If tank is not provided by propane supplier, verify propane tank is ASME labeled.	A	QA	—
		Field Visit	<b>Piping Identification</b> - Verify polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines are provided for non-metallic underground piping systems	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Energy Supply Systems (continued)</b>	<b>Propane - Interior</b>	Field Visit	Verify the propane installation meets the requirements specified in NFPA 58.	A	QA	—
		Submittal Process	<b>Piping</b> - Verify standard pipe dimension ratio is not more than 11.5	A	RA	—
	<b>Steam - Exterior Underground</b>	Submittal Process	Confirm the submission of a Certificate of Satisfactory Operation certifying that at least 3 systems installed by the piping system manufacturer within the previous 10 years have and are operating satisfactorily for not less than 5 years.	A	RA	S
		Submittal Process	Confirm the submission of a written certification by the piping system manufacturer that the distribution system installer is technically qualified and experienced in the installation of the system.	A	RA	S
		Submittal Process/ Field Visit	Verify underground steam and condensate piping in separate conduits is direct buried, factory pre-fabricated, pre-insulated, and consist of a steel service pipe with polyurethane insulation and a high-density polyethylene (HDPE) jacket.	A	RA/ QA	—
		Submittal Process/ Field Visit	Confirm piping system fittings and components are factory fabricated and no field insulated fittings are provided.	A	RA/ QA	—
		Field Visit	Verify asbestos cement or plastic conduit piping is not provided.	A	QA	—
		Field Visit	<b>Piping Insulation</b> - Verify the piping system insulation thickness is in accordance with contract requirements.	A	QA	—
		Submittal Process	<b>Isolation Valves</b> - Verify ASME class 150 isolation valves are provided in manholes for system supply and return lines at take-offs for service to each building .	A	QA	—
		Submittal Process/ Field Visit	<b>Expansion Loops</b> - Verify expansion loops are utilized to compensate for piping expansion.	A	RA/ QA	S
		Submittal Process/ Field Visit	<b>Expansion Anchors</b> - Verify piping expansion anchors are located outside manholes.	A	RA/ QA	—
		Field Visit	<b>Manholes</b> - Verify system manholes are constructed of reinforced, 206.8 bar (3000 psi) concrete. Verify manhole floor and sides are watertight and were made in one monolithic pour. Verify manhole top extends a minimum of 300 mm (6 inches) above grade. V	A	QA	—
		Submittal Process	Verify a sump pit and a vertical sump pump designed for an operating temperature design of 93 degrees C (195 degrees F) minimum are provided in each system manhole.	A	RA	—
		Submittal Process	<b>Sump Pump - Float Control</b> - Verify a 2-pole float control is provided for each manhole sump pump.	A	RA	—
		Submittal Process/ Field Visit	<b>Valves</b> - For system valves located outside of manholes, verify a cast-iron or ductile-iron valve box and cover of a suitable size are provided. Verify the box cover has the word(s) describing the utility cast on the cover.	A	RA/ QA	—



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Energy Supply Systems (continued)</b>	<b>Steam - Exterior Aboveground</b>	Submittal Process	<b>Piping</b> - Verify steam piping is either ASTM A 53 Type E (electric-resistance welded, Grade A or B) black steel pipe or ASTM A 53 Type S (seamless, Grade A or B) black steel pipe or, for pipe sizes through 250 mm (9 inches), ASTM A 106 (Grade A or B) black	A	RA	—
		Submittal Process	<b>Piping</b> - Verify condensate piping is either ASTM A 53 Type E (electric-resistance welded, Grade A or B) black steel, Weight Class XS (Extra Strong); or ASTM A 53 Type S (seamless, Grade A or B) black steel, Weight Class XS (Extra Strong); or ASTM A 106, G	A	RA	—
		Field Visit	<b>Piping Insulation</b> - Verify piping insulation is either fibrous glass, calcium silicate, or cellular glass as indicated in submitted shop drawings. Verify pipe insulation matches existing or surrounding insulation if applicable.	A	QA	—
		Field Visit	<b>Piping Insulation</b> - Verify the piping system insulation thickness is in accordance with contract requirements.	A	QA	—
		Field Visit	<b>Insulation</b> - Verify insulation is covered with an with aluminum jacket painted to conform with the Base Architectural Plan.	A	QA	—
		Submittal Process/ Field Visit	Verify the use of either MSS SP-58 or MSS SP-69 adjustable supports with insulation protection saddles. Verify roller supports utilize stainless steel axles.	A	RA/ QA	—
		Field Visit	<b>Support Poles</b> - Verify support poles are installed with guy wires and necessary hardware.	A	QA	—
		Submittal Process/ Field Visit	<b>Pipe Expansion</b> - Verify pipe expansion is compensated by utilizing either expansion loops, guided sliexpansion joints, or flexible ball type expansion joints.	A	RA/ QA	S
	<b>Steam - Interior</b>	Submittal Process	<b>Steam piping</b> - Verify is ASTM A106 or A53, Grade B, Schedule 40, black steel, electric-resistance welded or seamless	A	RA	—
		Submittal Process/ Field Visit	<b>Steam piping</b> - Verify insulated with mineral fiber or cellular glass insulation with all-purpose jacket	A	RA/ QA	—
		Submittal Process	<b>Condensate return piping</b> - Verify is ASTM A106 or ASTM A53, Grade B, Schedule 80, black steel, electric-resistance welded or seamless	A	RA	—
		Submittal Process/ Field Visit	<b>Condensate return piping</b> - Verify insulated with mineral fiber or cellular glass insulation with all-purpose jacket	A	RA/ QA	—
		Submittal Process	<b>Steel pipe fittings</b> - For piping 50 mm (2 inch) and smaller, verify is ANSI/ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or ASME B16.11 threaded type (Class 2000)	A	RA	—
		Submittal Process	<b>Steel pipe fittings</b> - For piping 63 mm (2-1/2 inch) and larger, verify is ANSI/ASME B16.9 butt-welding fittings or ANSI/ASME B16.5 flanged type	A	RA	—
		Field Visit	<b>Steam pressure reducing station</b> - Verify provided for each building	A	QA	—

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Energy Supply Systems (continued)		Submittal Process/ Field Visit	<b>Steam traps</b> - Verify steam traps and accessories are in accordance with UFC 3-400-10N	A	RA/ QA	—
		Field Visit	Verify all valves, traps, and PRV's are accessible for service & maintenance	A	QA	—
	<b>Hot Water - Exterior Underground</b>	Submittal Process/ Field Visit	<b>Piping</b> - Verify underground hot water supply & return piping in separate conduits is direct buried, factory pre-fabricated, pre-insulated, and consist of a steel service pipe with polyurethane insulation and a high-density polyethylene (HDPE) jacket.	A	RA/ QA	—
		Submittal Process/ Field Visit	Confirm piping system fittings and components are factory fabricated and no field insulated fittings are provided.	A	RA/ QA	—
		Field Visit	Verify asbestos cement or plastic conduit piping is not provided.	A	QA	—
		Submittal Process	The UHDS representative shall be certified in writing by the UHDS manufacturer to be technically qualified and experienced in the installation of the system. Provide a Certificate of Satisfactory Operation certifying that at least 3 systems installed by	A	QA	S
		Field Visit	<b>Piping Insulation</b> - Verify the piping system insulation thickness is in accordance with contract requirements.	A	QA	—
		Submittal Process/ Field Visit	<b>Isolation Valves</b> - Verify ASME class 150 isolation valves are provided in manholes for system supply and return lines at take-offs for service to each building .	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Expansion Loops</b> - Verify expansion loops are utilized to compensate for piping expansion.	A	RA/ QA	S
		Submittal Process/ Field Visit	<b>Manholes</b> - Verify system manholes are constructed of reinforced, 206.8 bar (3000 psi) concrete. Verify manhole floor and sides are watertight and were made in one monolithic pour. Verify manhole top extends a minimum of 300 mm (6 inches) above grade. V	A	RA/ QA	—
		Submittal Process	Verify a sump pit and a vertical sump pump designed for an operating temperature design of 93 degrees C (195 degrees F) minimum are provided in each system manhole.	A	RA	—
		Submittal Process	<b>Sump Pump - Float Control</b> - Verify a 2-pole float control is provided for each manhole sump pump.	A	RA	—
		Submittal Process/ Field Visit	<b>Valves</b> - For system valves located outside of manholes, verify a cast-iron or ductile-iron valve box and cover of a suitable size are provided. Verify the box cover has the word(s) describing the utility cast on the cover.	A	RA/ QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Er	Hot Water - Exterior Aboveground	Submittal Process	<b>Piping</b> - Verify hot water piping is either ASTM A 53 Type E (electric-resistance welded, Grade A or B) black steel, Weight Class XS (Extra Strong); or ASTM A 53 Type S (seamless, Grade A or B) black steel, Weight Class XS (Extra Strong); or ASTM A 106, Gr	A	RA	—
		Field Visit	<b>Piping Insulation</b> - Verify piping insulation is either fibrous glass, calcium silicate, or cellular glass as indicated in submitted shop drawings.	A	QA	—
		Field Visit	<b>Piping Insulation</b> - Verify the piping system insulation thickness is in accordance with contract requirements.	A	QA	—
		Field Visit	<b>Insulation</b> - Verify insulation is covered with an with aluminum jacket painted to conform with the Base Architectural Plan.	A	QA	—
		Submittal Process/ Field Visit	<b>Pipe Expansion</b> - Verify pipe expansion is compensated by utilizing either expansion loops, guided slip expansion joints, or flexible ball type expansion joints.	A	RA/ QA	S
		Submittal Process/ Field Visit	Verify the use of either MSS SP-58 or MSS SP-69 adjustable supports with insulation protection saddles. Verify roller supports utilize stainless steel axles.	A	RA/ QA	—
		Field Visit	<b>Support Poles</b> - Verify support poles are installed with guy wires and necessary hardware.	A	QA	—
	Hot Water - Interior	Submittal Process	<b>Piping</b> - Verify hot water piping is electric resistance, welded or seamless, schedule 40, black steel pipe conforming to ASTM A53. Piping 100mm (4 inch) and smaller may be ASTM B 88 Type K or L copper.	A	RA	—
		Submittal Process	<b>Steel fittings - For piping 50mm (2 inch) and smaller</b> , verify provided ANSI/ASME B16.3 malleable iron screwed fittings <b>OR</b> ASME B16.11 socket welding (Class 3000) fittings <b>OR</b> ASME B16.11 threaded type (Class 2000)	A	RA	—
		Submittal Process	<b>Steel fittings - For piping 63 mm (2-1/2 inch) and larger</b> , verify provided ANSI/ASME B16.9 butt-welding fittings <b>OR</b> ANSI/ASME B16.5 flanged type	A	RA	—
		Submittal Process	<b>Copper fittings</b> - Verify ANSI B16.18 cast bronze solder joint type or ASME/ANSI B16.22 wrought copper solder joint type	A	RA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Energy Supply Systems (continued)</b>		Submittal Process/ Field Visit	<b>Insulation</b> - Verify hot water piping insulated with mineral fiber insulation with factory-applied all-purpose jacket	A	RA/ QA	—
		Field Visit	<b>Isolation valves</b> - Verify equipment provided with isolation valves for service and repairs	A	QA	—
		Submittal Process/ Field Visit	<b>Valves</b> - Verify appropriately sized	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Balancing valves</b> - Verify provided and appropriately sized to balance water flow	A	RA/ QA	QA
		Field Visit	<b>Appurtenances</b> - Verify provided (such as air separators, expansion tanks, suction diffusers, strainers, etc)	A	QA	—
		Field Visit	<b>Test ports</b> - Verify provided in piping at inlet and outlet of all major system components including boilers, pumps, etc)	A	QA	QA
		Field Visit	Verify all valves and test ports are accessible for service and maintenance	A	QA	—
	<b>Chilled Water &amp; Condenser Water - Exterior Underground</b>	Submittal Process	Verify system provided is direct buried, factory-prefabricated, pre-insulated, chilled water piping systems. Verify all fittings and accessories are designed and factory-fabricated to prevent moisture from entering into the system by manufacturer.	A	RA	S
		Field Visit	Verify backfill and overall installation meets the requirements of the piping system manufacturer.	A	QA	—
		Field Visit	<b>Isolation Valves</b> - Verify supply and return line isolation valves are provided at take-offs for service to each building in valve boxes.	A	QA	—
		Submittal Process/ Field Visit	Verify expansion loops are provided to compensate for piping expansion. Verify anchors are provided outside manholes.	A	RA/ QA	S
	<b>Chilled Water &amp; Condenser Water - Exterior Aboveground</b>	Submittal Process	<b>Piping</b> - Verify chilled and condenser water piping are either electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53 or, for piping 100 mm (4 inch) and smaller, ASTM B 88 Type K or L copper.	A	RA	—
		Submittal Process	If steel piping is used, verify for piping 50 mm (2 inch) and smaller, ANSI/ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000) fittings are provided. For piping 63 mm (2-1/2 inch) and large	A	RA	—
		Submittal Process	If copper piping is used, verify ANSI B16.18 cast bronze solder joint fittings or ASME/ANSI B16.22 wrought copper solder joint fittings are provided.	A	RA	—
		Submittal Process/ Field Visit	<b>Piping Insulation</b> - Verify piping insulation is either Mineral fiber, Urethane, cellular glass, Faced Phenolic Foam, or Flexible Cellular pipe insulation as indicated in submitted shop drawings.	A	RA/ QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Energy Supply Systems (continued)</b>		Field Visit	<b>Piping Insulation</b> - Verify the piping system insulation thickness is in accordance with contract requirements.	A	QA	—
		Field Visit	<b>Piping Insulation</b> - Verify piping insulation is covered with an aluminum jacket.	A	QA	—
		Submittal Process/ Field Visit	Verify the use of either MSS SP-58 or MSS SP-69 adjustable supports with insulation protection saddles. Verify roller supports utilize stainless steel axles.	A	RA/ QA	—
		Field Visit	<b>Support Poles</b> - Verify support poles are installed with guy wires and necessary hardware.	A	QA	—
		Submittal Process/ Field Visit	<b>Pipe Expansion</b> - Verify pipe expansion is compensated by utilizing either expansion loops, guided slip expansion joints, or flexible ball type expansion joints.	A	RA/ QA	S
	<b>Chilled Water &amp; Condenser Water - Interior</b>	Submittal Process	<b>Aboveground chilled &amp; condenser water piping</b> - Verify aboveground chilled water piping is electric resistance welded or seamless schedule 40 black steel pipe conforming to ASTM A 53. Piping 100mm (4 inch) and smaller may be ASTM B 88 Type K or L copper.	A	RA	—
		Submittal Process	<b>Steel pipe fittings - For piping 50mm (2 inch) and smaller</b> - Verify provided ANSI/ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000).	A	RA	—
		Submittal Process	<b>Steel pipe fittings - For piping 63mm (2-1/2 inch) and larger</b> - Verify provided ASME/ANSI B16.9 butt-welding fittings or ASME/ANSI B16.5 flanged type.	A	RA	—
		Submittal Process	<b>Steel pipe fittings</b> - Grooved joint pipe coupling systems of appropriate pressure rating are acceptable in lieu of welded or screwed fittings	A	RA	—
		Submittal Process	<b>Copper fittings</b> - Verify provided ANSI B16.18 cast bronze solder joint type or ASME/ANSI B16.22 wrought copper solder joint type	A	RA	—
		Field Visit	<b>Isolation valves</b> - Verify isolation valves provided on supply and return lines at take-offs for service to each building	A	QA	—
		Field Visit	<b>Isolation valves</b> - Verify isolation valves located in valve boxes	A	QA	—
		Submittal Process/ Field Visit	<b>Insulation</b> - Verify above-ground chilled water piping insulated with cellular glass insulation. Flexible unicellular insulation may be used on small piping runouts.	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Insulation</b> - Verify above-ground condenser water piping insulated with mineral fiber insulation	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Insulation</b> - Verify all-purpose jacket with vapor retarder provided for above-ground chilled water and condenser piping	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Valves</b> - Verify appropriately sized	A	RA/ QA	—

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Energy Supply Systems (cont)		Submittal Process/ Field Visit	<b>Balancing valves</b> - Verify provided and appropriately sized to balance water flow	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Relief valves</b> - Verify provided and appropriately sized	A	RA/ QA	—
		Field Visit	<b>Test ports</b> - Verify test ports provided in piping at inlet and outlet of all major system components including chillers, pumps, etc	A	QA	QA
		Field Visit	Verify all valves and test ports are accessible for service and maintenance	A	QA	—
	AHU's - ALL	Field Visit	<b>DDC Sensors</b> - Confirm location of DDC sensors (temp, SP, Freeze, High pressure SP, AFM), if required	A	QA	QA
		Field Visit	<b>Smoke Detectors</b> - Confirm location of smoke detectors (if over 2000 cfm)	A	QA	QA
		Field Visit	<b>Testing - Filters</b> - Confirm filters are clean prior to testing	A	QA	QA
		Field Visit	<b>Filters</b> - Confirm filters are installed	—	—	—
		Field Visit	<b>Belts</b> - Confirm belt tightness and alignment	A	QA	QA
		Field Visit	<b>Coils</b> - Confirm all coils are clean	A	QA	QA
		Field Visit	<b>Vibration Isolators</b> - Confirm vibration isolators installed according to contract docs and unit secured	A	QA	QA
		Field Visit	<b>Damper</b> - Confirm damper operation and assembly tightness	A	QA	QA
		Field Visit	<b>Motor</b> - Confirm motor size (HP), voltage, amperage, and rpm	A	QA	QA
		Submittal Process	<b>Fans</b> - Verify provided have AMCA 210 certified fans with AMCA seal	A	QA	—
		Field Visit	<b>Fans</b> - Confirm fan rpm and rotation direction	A	QA	QA
		Field Visit	<b>OA Intake Plenum</b> - Confirm OA intake plenum configuration provides for drainage	A	QA	QA
		Field Visit	<b>AFM</b> - Confirm air flow monitoring station location in conformance with manufacturer requirements	A	QA	QA
		Field Visit	<b>Size</b> - Confirm unit matches schedule req	A	QA	QA
		Submittal Process/ Field Visit	<b>Fan bearings</b> - Verify fan bearings were greased (if req) and have min average life of 200,000 hours at design operating conditions	A	RA/ QA	—
		Field Visit	<b>Birdscreens</b> - Verify birdscreens provided for outdoor inlets and outlets	A	QA	QA
		Field Visit	Verify all filter and access doors are accessible for service and maintenance	A	QA	—
		Field Visit	Verify provided are modular construction, double wall AHU's with min of 25mm (1 inch) casing insulation	A	QA	—
		Submittal Process	Verify provided have ARI 430 certified fans and ARI certified coils	A	RA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment & Components (continued)		Submittal Process/ Field Visit	<b>Drain pan</b> - Verify provided has stainless steel, positive draining condensate drain pan	A	RA/ QA	—
		Submittal Process	<b>For 100% OA units</b> - Verify capability provided for cooling, heating, dehumidification, and reheat	A	RA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - Verify central station ahu's provided with an ultraviolet c-band (UVC) disinfection system for mold, bacteria, and odor control in each air handler that has a chilled water or DX cooling coil	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - Verify irradiation emitters and fixtures installed in sufficient quantity and in such an arrangement so as to provide an equal distribution of UVC energy on the coil and in the drain pan	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - Verify the UVC energy produced has the lowest possible reflected and shadowed losses (To maintain energy efficiency)	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - For energy efficiency, verify power supplies are of the high efficiency electronic type and matched to the emitter	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - For intensity, verify the minimal UVC energy striking the leading edge (if installed upstream) or trailing edge (if installed downstream) of all the coil fins is not less than 820 uW/cm2 at the closest point and through pl	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - Verify equal amounts strike the drain pan, either directly or indirectly through reflection	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - For installation, verify emitters and fixtures are installed at right angles to the conforming lines of the coil fins, such that through incident angle reflection, UVC energy bathes all surfaces of the coil and drain pan	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Ultraviolet disinfection system</b> - Verify one complete set of spare bulbs supplied	A	RA/ QA	—
	<b>AHU's - Split System</b>	Submittal Process	Verify provided is factory assembled, packaged AHU rated in accordance with ARI 210/240 or ARI 340/360	A	RA	—
		Field Visit	Verify matching components provided are from the same manufacturer	A	QA	—
	<b>AHU's - Rooftop</b>	Submittal Process/ Field Visit	Verify provided is factory packaged unit in accordance with ARI 430 and suitable for outdoor installation	A	RA/ QA	—
		Field Visit	<b>Roof Curb</b> - Verify provided with manufacturer's roof curb	A	QA	—



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>ment &amp; Components (continued)</b>	<b>Roof Curbs</b>	Field Visit	<b>Mounting Surface</b> - Confirm fan or unit mounting surface is parallel to the horizon, not the roof deck if sloped	A	QA	—
		Field Visit	<b>Waterproofing</b> - Confirm curb has been flashed properly and seal to the roofing material (no leaks) (waterproofing)	A	QA	—
		Field Visit	<b>Lightning Rods</b> - Confirm lightning rods have been attached to units and run to ground	A	QA	—
		Field Visit	<b>Insulation</b> - Confirm roof curb is insulated	A	QA	—
		Field Visit	<b>Size</b> - Confirm curb is the same size or smaller as the unit being placed on it (tight fit)	A	QA	—
	<b>Fans - ALL</b>	Submittal Process/ Field Visit	Verify fans are AMCA 210 certified with AMCA seal	A	RA/ QA	—
		Submittal Process	<b>Fan bearings</b> - Verify fan bearings have min average life of 200,000 hours at design operating conditions	A	RA	—
		Field Visit	<b>Rotation</b> - Confirm rotation and alignment	A	QA	QA
		Field Visit	<b>Belts</b> - Confirm belt tightness (if provided)	A	QA	QA
		Field Visit	<b>Motor</b> - Confirm HP, voltage, amperage	A	QA	QA
		Field Visit	<b>Size</b> - Confirm size matches schedule req	A	QA	QA
		Field Visit	Verify fans are accessible for service and maintenance	A	QA	
		Field Visit	<b>Birdscreens</b> - Verify bird screens provided for outdoor inlets and outlets	A	QA	QA
		Field Visit	<b>DDC</b> - Verify fans provided with means for verifying operation via DDC system	A	QA	QA
	<b>Exhaust Fans (Roof)</b>	Field Visit	<b>Roof Curb</b> - Confirm lag bolted to roof curb	A	QA	QA
		Field Visit	<b>Dome Top</b> - Confirm dome top is secured	A	QA	QA
		Field Visit	<b>Type</b> - Verify centrifugal fans provided	A	QA	
	<b>In-line Fans</b>	Field Visit	<b>Vibration Isolators</b> - Confirm hangers & isolation devices	A	QA	QA
		Field Visit	<b>Flex Connection</b> - Confirm flexible connection to ductwork	A	QA	QA
		Field Visit	<b>Speed Controller</b> - Confirm speed controller installation (if provided)	A	QA	QA
		Field Visit	<b>Access Panel</b> - Confirm access panel located properly	A	QA	QA
		Field Visit	<b>Type</b> - Verify centrifugal fans provided	A	QA	—
	<b>Wall Fans</b>	Field Visit	<b>Type</b> - Verify wall fans provided are propeller fans with fan guards	A	QA	—
		Field Visit	<b>Type</b> - Verify wall fans provided are centrifugal fans with backdraft dampers and wall bracket	A	QA	—
	<b>Bathroom Fan</b>	Submittal Process/ Field Visit	Verify provided are UL 507 and UL-Listed, Home Ventilating Institute (HVI) certified, and with AMCA seal for ceiling installation	A	RA/ QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment	Range Hoods	Submittal Process/ Field Visit	Verify provided are UL 507 and UL-Listed, with AMCA seal	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Light</b> - Verify provided with light over stove	A	RA/ QA	—
		Submittal Process	Verify min fan capacity is 160 cfm with max sound level of 5.6 sones	A	RA	—
	Louvers & Hoods - ALL	Submittal Process	<b>Louver rating</b> - Verify louvers bear AMCA ratings seal for air performance and water penetration in accordance with AMCA 500 and AMCA 511	A	RA	—
		Submittal Process/ Field Visit	<b>Construction</b> - Verify hoods and louvers constructed of anodized aluminum alloy or stainless steel	A	RA/ QA	
		Submittal Process/ Field Visit	<b>Birdscreens</b> - Verify provided for louvers and hoods	A	RA/ QA	QA
	Intake Hood (Roof)	Submittal Process/ Field Visit	<b>Type</b> - Confirm type as specified	A	RA/ QA	QA
		Field Visit	Confirm top is secured	A	QA	QA
		Submittal Process/ Field Visit	<b>Size</b> - Confirm size matches schedule req (free area)	A	RA/ QA	QA
	OA Intake Louvers (Wall)	Submittal Process/ Field Visit	<b>Type</b> - Confirm type as specified	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Size</b> - Confirm size matches schedule req (free area)	A	RA/ QA	QA
		Submittal Process/ Field Visit	Confirm waterproof (when req) and velocity when water carry-over occurs	A	RA/ QA	QA
		Field Visit	<b>Intake Plenum</b> - Confirm intake plenum is sloped back to louver or drain has been provided	A	QA	QA
		Field Visit	<b>Damper</b> - Confirm opposed blade damper with actuator has been provided	A	QA	QA
		Field Visit	<b>AFM</b> - Confirm air flow monitoring type louver has been provided, if req	A	QA	QA



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>	<b>Ductwork</b>	Field Visit	<b>Construction</b> - Except as specified herein, verify ductwork constructed, braced, reinforced, installed, supported, and sealed per SMACNA standards	A	QA	QA
		Field Visit	Verify all dampers are accessible for service and maintenance	A	QA	—
		Field Visit	Confirm general construction conforms to contract documents	A	QA	QA
		Field Visit	Confirm correct pressure rating of ductwork has been conformed to SMACNA	A	QA	QA
		Field Visit	Confirm ductwork has been sealed in accordance with specified seal class	A	QA	QA
		Field Visit	<b>VAV inlet</b> - Confirm minimum straight duct is 6 duct diameters and same size as VAV terminal inlet	A	QA	QA
		Field Visit	Confirm DALT allowables are met	A	QA	QA
		Submittal Process/ Field Visit	<b>Access Doors</b> - Confirm access doors have been provided before every elbow with turning vanes	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Access Doors</b> - Confirm access doors provided at appropriate locations	A	RA/ QA	QA
		Field Visit	<b>Flexible duct</b> - Verify insulated flexible duct used only to adapt to minor offsets for connections to air distribution devices	A	QA	QA
		Submittal Process	<b>Flexible duct</b> - Verify is UL 181 listed and per SMACNA DCS with minimum R value of 4	A	RA	—
		Field Visit	<b>Flexible duct</b> - Verify maximum length is 2 meters (6 feet)	A	QA	QA
		Field Visit	<b>Flexible Duct</b> - Confirm, where flexible ductwork is specified, that the length of flex ductwork is provided to the max req length or less and is supported properly with no abrupt turns (ie: as straight as possible)	A	QA	QA
		Field Visit	<b>Flexible connectors</b> - Verify provided between fans and ducts	A	QA	QA
		Submittal Process/ Field Visit	<b>Damper</b> - Confirm balancing damper at branch take-off's, not at diffuser neck	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Damper</b> - Confirm balancing damper construction conforms to the specified seal class	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Damper</b> - Confirm discharge damper installed on VAV terminal discharge, if req	A	RA/ QA	QA
		Field Visit	<b>Damper</b> - Confirm control damper type and location along with actuator type	A	QA	QA
		Submittal Process	<b>Dampers</b> - Verify conforms to SMACNA DCS	A	RA	—
		Submittal Process	<b>Fire dampers</b> - Verify are rated per UL 555	A	RA	—
		Submittal Process	<b>Fire dampers</b> - Verify are dynamic type rated for closure against a moving airstream	A	RA	—

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
ent & Components (continued)		Submittal Process/ Field Visit	<b>Fire dampers</b> - Verify do not intrude into air stream when in open position	A	RA/ QA	—
		Submittal Process	<b>Smoke dampers</b> - Verify are rated per UL 555S	A	RA	—
		Submittal Process/ Field Visit	<b>Elbows</b> - Confirm correct elbow type (ie: double wall turning vane, 1.5 radius curved, etc)	A	RA/ QA	QA
		Field Visit	<b>Bracing</b> - Confirm proper bracing of high pressure ductwork in accordance with SMACNA	A	QA	QA
		Field Visit	<b>Filters</b> - Confirm access to filter rack for ease of filter change out in duct mounted assemblies	A	QA	QA
		Submittal Process/ Field Visit	<b>Insulation</b> - Confirm ductwork insulated properly (ext batt, hard, int lined, double wall insulated, etc)	A	RA/ QA	QA
		Field Visit	<b>Insulation</b> - Inspect vapor barrier of insulation	A	QA	—
		Field Visit	<b>Hangers</b> - Confirm proper duct hangers have been utilized in accordance with spec req	A	QA	QA
		Field Visit	<b>Vibration Isolators</b> - Confirm the use of vibration isolation material at unit connection to ductwork free of holes (no leakage)	A	QA	QA
		Submittal Process	<b>Sound attenuators</b> - Verify fabricated sound attenuators reduces the rated sound pressure level of the fan down to at least 65 decibels in the 250 Hz (third octave band) center frequency by using a reference sound source calibrated in decibels of sound pow	A	RA	—
		Submittal Process/ Field Visit	<b>Sound attenuators</b> - Verify pressure drop does not exceed 157 Pa (0.63 inch of water)	A	RA/ QA	QA
	<b>VAV Boxes - ALL</b>	Submittal Process	Verify units are pressure-independent type and rated per ARI 880	A	QA	—
		Field Visit	<b>Primary air valve</b> - Verify not allowed to fully shut-off	A	QA	QA
		Field Visit	<b>Heating coil</b> - Verify each box provided with heating coil unless not required by space reheat or heating	A	QA	—
		Field Visit	Verify all VAV box control panels are accessible	A	QA	
		Field Visit	<b>Electronic controls</b> - Verify are provided	A	QA	QA
	<b>VAV Terminal Box (Fan-Powered)</b>	Submittal Process	<b>Type</b> - Verify units are pressure-independent, fan powered, rated per ARI 880, and UL listed	A	QA	—
		Field Visit	<b>Filters</b> - Confirm filter installed and clean	A	QA	QA
		Field Visit	Confirm ductwork on primary inlet is installed with 6 straight duct diameters the same size as the inlet	A	QA	QA
		Submittal Process/ Field Visit	<b>Dampers</b> - Confirm discharge damper has been provided and/or coordinated with sheet metal contractor	A	QA	QA
		Field Visit	Confirm fan size & primary inlet sized in accordance with contract documents	A	QA	—
		Field Visit	<b>Primary Air Valve</b> - Confirm max/min setting of primary air valve	A	QA	QA
		Field Visit	<b>Primary air valve</b> - Verify not allowed to fully shut-off	A	QA	QA

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment		Field Visit	<b>Size</b> - Confirm size matches schedule req	A	QA	QA
		Field Visit	<b>Motor</b> - Confirm HP, voltage, and amperage of fan motor	A	QA	QA
		Field Visit	<b>Heating coil</b> - Verify each box provided with heating coil, if required	A	QA	—
		Field Visit	<b>Reheat Coils</b> - Confirm reheat coil size, if req	A	QA	—
		Field Visit	<b>Reheat Coils</b> - Confirm reheat coil is piped properly	A	QA	QA
		Field Visit	<b>Sensors</b> - Confirm discharge temp sensor provided, if req	A	QA	QA
		Field Visit	Confirm hangers have provisions for vibration isolation	A	QA	QA
		Field Visit	<b>Electronic controls</b> - Verify provided with speed controller, discharge volume control damper(s), and return/recirculation air frame and filter	A	QA	QA
		Submittal Process	<b>Insulation</b> - Verify in accordance with ASHRAE 90.1	A	RA	—
	<b>VAV Terminal Box (Shut Off)</b>	Field Visit	Confirm ductwork on primary inlet is installed with 6 straight duct diameters the same size as the inlet	A	QA	QA
		Field Visit	<b>Primary Air Valve</b> - Confirm max and min setting of primary air valve	A	QA	QA
		Field Visit	<b>Reheat Coils</b> - Confirm reheat coil size, if req	A	QA	—
		Field Visit	<b>Reheat Coils</b> - Confirm reheat coil in piping properly	A	QA	QA
		Field Visit	<b>Sensors</b> - Confirm discharge temp sensor provided, if req	A	QA	QA
		Field Visit	Confirm hangers have provisions for vibration isolation	A	QA	QA
		Field Visit	<b>Size</b> - Confirm box size matches schedule req	A	QA	QA
	<b>DX VAV Units</b>	Submittal Process	<b>Finish</b> - If indicated in ESR Section D30, verify anti-corrosion coating provided is immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	QA	—
		Submittal Process/ Field Visit	<b>Direct expansion equipment</b> - Verify is specifically designed and manufactured for VAV applications	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Equipment</b> - Verify from the same manufacturer (central air handling units, VAV boxes/ zone dampers, and zone controls)	A	RA/ QA	—
		Field Visit	<b>Evaporator coils</b> - Verify airflow through evaporator coils is not modulated	A	QA	—
		Field Visit	<b>Zone control damper units</b> - Verify duct mounted zone control damper units provided with integral control box designed for use with DX VAV packaged systems	A	QA	—
		Submittal Process/ Field Visit	<b>Air diffusers</b> - Verify self-modulating air diffusers are not used	A	RA/ QA	—
	<b>Condensing Units</b>	Submittal Process/ Field Visit	<b>Finish</b> - If indicated in ESR Section D30, verify anti-corrosion coating provided is immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	RA/ QA	—
		Submittal Process	<b>Air conditioner</b> - Verify air-cooled, split system air conditioner provided with ducted air distribution	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<i>System</i>	<i>Sub-Systems</i>	<i>Phase</i>	<i>Elements</i>	<i>ME QC / DOR (Ktr)</i>	<i>FEAD (SIOH)</i>	<i>FEC (PCAS)</i>
<i>Equipment &amp; Components (continued)</i>		Submittal Process	<b>Construction and rating</b> - Verify units are factory assembled, designed, tested, and rated in accordance with ARI 210/ 240 or ARI 340/ 360	A	QA	—
		Submittal Process/ Field Visit	<b>Clearance</b> - Verify manufacturer's minimum recommended clearance around condensing units is provided	A	RA/ QA	QA
		Field Visit	<b>Refrigerant piping size</b> - Verify is per manufacturer's recommendations	A	QA	—
	<b>Heat Pumps - Ground Source</b>	Submittal Process/ Field Visit	<b>Finish</b> - If indicated in ESR Section D30, verify anti-corrosion coating provided is immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	RA/ QA	—
		Submittal Process	<b>Construction and rating</b> - Verify units are factory assembled, designed, tested, and rated in accordance with ARI 330	A	QA	—
		Submittal Process	<b>Heat exchanger</b> - Verify connected to heat exchanger by closed loop ground source vertical well field	A	RA	—
		Submittal Process/ Field Visit	<b>Well field</b> - Verify design and installation of each well field comply with IGSHPA and ASHRAE standards	A	RA/ QA	—
	<b>Heat Pumps - Water Source</b>	Submittal Process/ Field Visit	<b>Finish</b> - If indicated in ESR Section D30, verify anti-corrosion coating provided is immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	RA/ QA	—
		Submittal Process	<b>Construction and rating</b> - Verify units are factory assembled, designed, tested, and rated in accordance with ARI 210/ 240 or ARI 340/ 360	A	QA	—
	<b>Heat Pumps - Air to Air</b>	Submittal Process/ Field Visit	<b>Finish</b> - If indicated in ESR Section D30, verify anti-corrosion coating provided is immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	RA/ QA	—
		Submittal Process	<b>Heat pumps</b> - Verify air-cooled, split system heat pumps provided with ducted air distribution	A	RA/ QA	—
		Submittal Process	<b>Construction and rating</b> - Verify units are factory assembled, designed, tested, and rated in accordance with ARI 210/ 240 or ARI 340/ 360	A	QA	QA
		Field Visit	<b>Clearance</b> - Verify manufacturer's minimum recommended clearance around condensing units is provided	A	QA	—
		Field Visit	<b>Refrigerant piping size</b> - Verify is per manufacturer's recommendations	A	QA	QA
		Field Visit	<b>Insulation</b> - Verify provided for refrigerant piping suction lines and condensate drain	A	QA	—
	<b>Condensate Return Units</b>	Submittal Process/ Field Visit	Verify has floor-mounted receiver and duplex pump unit	A	RA/ QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>	<b>Equipment Thermal Insulation</b>	Submittal Process/ Field Visit	<b>Insulation</b> - Verify insulation provided for hot and chilled water pumps and equipment as suitable for the temperature and service fit as closely as possible to equipment. May be rigid block, semi-rigid board, or flexible unicellular insulation.	A	RA/ QA	QA
			<b>Vapor retarder</b> - Verify provided for chilled water applications	A	QA	—
	<b>Auxilliary Equipment</b>	Submittal Process/ Field Visit	<b>Steam-to-hot-water converter</b> - Verify provided as required for application	A	RA/ QA	—
		Submittal Process	<b>Heat exchangers</b> - Verify factory assembled u-tube units provided constructed in accordance with ASME BPVC for steam or hot water. For hot water, plate type heat exchangers may be provided.	A	RA	—
	<b>Furnaces</b>	Submittal Process/ Field Visit	<b>Construction</b> - Confirm provided furnace is UL-listed, factory assembled, self-contained, and forced circulation	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Electronic ignition system</b> - Verify provided	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Gas furnace rating</b> - Confirm unit is design certified by AGA and GAMA efficiency rating certified for gas furnaces.	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Oil furnace rating</b> - Confirm unit meets requirements for NFPA 31 for oil furnaces.	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Cooling coil</b> - Verify provided, if necessary	A	RA/ QA	—
	<b>Unit Ventilators</b>	Submittal Process/ Field Visit	Verify unit is a factory assembled unit ventilator capable of up to 100% OA ventilation and UL-Listed	A	RA/ QA	—
	<b>Unit Heaters</b>	Submittal Process/ Field Visit	See D302004 for gas fired unit heaters	A	RA/ QA	—
	<b>Unit Heaters- Steam</b>	Submittal Process/ Field Visit	Verify provided is UL-Listed and factory assembled	A	RA/ QA	—
	<b>Unit Heaters - Hot Water</b>	Submittal Process/ Field Visit	Verify provided is UL-Listed and factory assembled	A	RA/ QA	—
	<b>Unit Heaters - Cabinet</b>	Submittal Process/ Field Visit	Verify provided is UL-Listed and factory assembled	A	RA/ QA	—

## MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
	<b>Fuel-Fired Unit Heaters - Gas</b>	Submittal Process/ Field Visit	Verify meets requirements for ANSI Z83.8 and AGA label	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Discharge louver</b> - Verify each heater equipped with individually adjustable package discharge louver	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Thermostat</b> - Verify provided	A	RA/ QA	QA
	<b>Fuel-Fired Unit Heaters - Infrared</b>	Submittal Process/ Field Visit	Verify meets requirements for ANSI Z83.8 and AGA label	A	RA/ QA	—
	<b>Unit Heaters - Electric</b>	Submittal Process/ Field Visit	Verify provided are factory assembled, UL-1025	A	RA/ QA	—
	<b>Heaters - Baseboard</b>	Submittal Process/ Field Visit	Verify provided are factory assembled, UL-1042	A	RA/ QA	—
	<b>Heaters - Wall</b>	Submittal Process/ Field Visit	Verify provided are factory assembled, UL-1025, cabinet heaters	A	RA/ QA	—
	<b>Heaters - Infrared</b>	Submittal Process/ Field Visit	Verify provided are factory assembled, UL-Listed and labeled heaters	A	RA/ QA	—
	<b>Fin Tube Radiators &amp; Convectors</b>	Submittal Process	Verify fin tube radiators and convectors provided with copper tubes and aluminum fins	A	RA	—
		Submittal Process	<b>Control Valves</b> - Verify control valves provided are normally open, spring return	A	RA/ QA	QA
	<b>Duct Heater</b>	Submittal Process/ Field Visit	Verify provided is factory assembled, UL-Listed heater	A	RA/ QA	—
		Field Visit	Verify adequate duct length is provided per manufacturer's recommendations upstream & downstream	A	QA	—
		Submittal Process/ Field Visit	Verify control cabinet and heating coil provided	A	RA/ QA	—
	<b>Pumps - ALL</b>	Submittal Process/ Field Visit	Verify provided are centrifugal circulating pumps with motor, motor starter, and motor enclosure conforming to the appropriate NEMA standards	A	RA/ QA	—
		Field Visit	<b>Insulation</b> - Verify pumps used for hot service and chilled water service are insulated	A	QA	QA



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>	<b>Pumps - Base-mounted</b>	Field Visit	Confirm size and nameplate data matches schedule req	A	QA	QA
		Field Visit	Verify voltage service matches nameplate	A	QA	QA
		Field Visit	Verify provided are single-stage end suction pumps suitable for chilled, condenser, and hot water heating systems	A	QA	QA
		Field Visit	<b>Isolation Base</b> - Confirm isolation base is provided where req	A	QA	QA
		Field Visit	<b>Insulation</b> - Confirm insulation enclosure is provided where req	A	QA	QA
		Field Visit	Confirm pressure taps, gages, and shutoffs have been provided in the specified locations	A	QA	QA
		Field Visit	<b>Balancing Valves</b> - Confirm the balancing valves have been provided in accordance with manufacturers recommendations and/or in accordance with the appropriate contract document detail	A	QA	QA
		Field Visit	<b>Balancing Valves</b> - Confirm balancing valves provided with proper clearances	A	QA	QA
		Field Visit	<b>Rotation</b> - Verify rotation direction is correct	A	QA	QA
		Field Visit	<b>Suction diffusers</b> - Verify suction diffusers provided on base-mounted pumps	A	QA	QA
	<b>Pumps - In-line</b>	Field Visit	<b>Location</b> - Confirm location is correct(ie: in accordance with the contract documents)	A	QA	QA
		Field Visit	Verify constructed of manufacturer's standard materials suitable for chilled, condenser, and hot water heating systems	A	QA	QA
		Field Visit	Confirm voltage provided is correct	A	QA	QA
		Field Visit	<b>Valve Arrangement</b> - Confirm valve arrangement around the pump is correct	A	QA	QA
		Field Visit	<b>Balancing Valve</b> - Confirm balancing valve has been provided in accordance with the contract documents, if req	A	QA	QA
		Field Visit	<b>Balancing Valve</b> - Confirm balancing valves provided with proper clearances	A	QA	QA
	<b>Diffusers, Registers, &amp; Grilles</b>	Field Visit	Confirm location, size, and type have been provided in accordance with the contract documents	A	QA	QA
		Field Visit	<b>Dampers</b> - Confirm branch balancing dampers have been provided and dampers, if any, provided with the air device are in the wide open position	A	QA	QA
		Field Visit	<b>Finish</b> - Verify are factory-finished	A	QA	—
		Field Visit	<b>Exterior and exposed edges</b> - Verify are rolled, or otherwise stiffened and rounded	A	QA	—
	<b>Pipe Sleeves</b>	Field Visit	Verify pipe sleeves provided at each wall and floor penetration	A	QA	—
		Field Visit	Verify sleeves are of a material suitable to protect the carrier pipe (2 pipe sizes larger) and sealed with an appropriate flexible material	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>		Submittal Process/ Field Visit	<b>Fire Stopping</b> - In fire rated walls, verify fire stopping provided in accordance with IBC	A	RA/ QA	—
	<b>Piping Identification</b>	Field Visit	Verify piping provided with identification labels or stencil names or code letters for piping systems in clearly visible letters and symbols	A	QA	—
		Field Visit	Verify arrow-shaped markings provided to indicate direction of flow	A	QA	QA
	<b>Piping - Condensate Drain</b>	Submittal Process/ Field Visit	Verify condensate drain piping provided is ASTM B 88, Type M or L, hard drawn copper	A	RA/ QA	—
	<b>Piping</b>	Field Visit	<b>Flushing</b> - Confirm/ witness pipe flushing (make sure water is clear prior to putting final chemicals into water system)	V	W	—
		Field Visit	<b>Strainers</b> - Confirm start-up strainer has been removed from <u>all</u> strainers (hang at location)	A	QA	—
		Field Visit	<b>Air Vents</b> - Confirm air vents are at specified locations and are auto type, if req	A	QA	QA
		Submittal Process/ Field Visit	<b>Pressure Relief Valves</b> - Confirm pressure relief valves are sized properly and installed where specified	A	RA/ QA	QA
		Field Visit	Confirm make-up water pressure setting is sufficient for facility (adjust if req for pressure req at highest point)	A	QA	QA
		Field Visit	<b>Expansion Tanks</b> - Where diaphragm expansion tanks are provided, confirm tank pressure is set in accordance with nameplate	A	QA	QA
		Field Visit	Confirm valve arrangements for each unit coil are as specified on the contract documents	A	QA	QA
		Field Visit	Confirm all valve clearance req's, manufacturer, and/or contract have been adhered to	A	QA	QA
		Field Visit	<b>Layout</b> - Confirm piping layout conforms to the contract documents (physically walk all pipe runs to make sure there are no cross connections)	A	QA	QA
		Field Visit	Confirm traps have been provided on condensate lines per the contract documents	A	QA	
		Field Visit	Confirm slope of condensate lines meets spec req	A	QA	
		Field Visit	<b>Supports</b> - Confirm piping supported properly (ie: hangers, saddles, seismic (if req))	A	QA	QA
		Field Visit	<b>Insulation</b> - Confirm pipe insulated with specified insulation and vapor barrier is intact	A	QA	QA
		Submittal Process/ Field Visit	<b>Fittings</b> - Confirm dielectric fittings have been provided where piping of dissimilar metals connect	A	RA/ QA	—
		Field Visit	Confirm condensate piping from equip has been run to floor drains, if req	A	QA	QA
		Field Visit	<b>Identification</b> - Confirm piping is marked properly with water type and direction of flow	A	QA	QA
		Field Visit	Confirm provisions have been made in the piping arrangement at each coil for isolation of flow and ease of coil removal	A	QA	QA

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Components (continued)		Field Visit	Confirm steam piping relief valve has been piped to the exterior of the building in a safe location to personnel	A	QA	QA
		Field Visit	Confirm hazard warning and/or hot surface signage is in place at steam piping, equip. (This also applies to hot water systems)	A	QA	—
		Field Visit	<b>Flow Meters</b> - Confirm location of flow meters meets factory req for straight, unobstructed inlet and outlet piping	A	QA	QA
	Chillers	Field Visit	<b>Leaving Water Temp</b> - Confirm the leaving chilled water temp is below temp specified for terminal equip to compensate for pump heat gain (approx 1.8F/1.0C) (chiller leaving should <b>never</b> be same as temp req at terminal unit)	A	QA	QA
		Submittal Process/ Field Visit	Confirm piping/valve arrangement matches contract documents and balancing valve and flow monitoring device have been provided in accordance with manufacturers req and/or detail	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Decoupler</b> - Confirm decoupler leg is tied into chilled return piping before entering chilled water return header (for multiple chillers)	A	RA/ QA	QA
		Field Visit	Confirm piping arrangement has allotment for access to the cooling and condensing bundles	A	QA	QA
		Field Visit	<b>Flow Switch</b> - Confirm flow switch has been provided to protect the chiller from low or lack of flow	A	QA	QA
		Submittal Process/ Field Visit	Confirm BACNET compatible (if req in contract docs) and that the connection has been made to the DDC control system	A	RA/ QA	QA
	Chiller Systems Closed Circuit Coolers	Submittal Process	<b>Construction and rating</b> - Confirm provided is factory assembled conforming to NFPA 214	A	RA	—
		Submittal Process	<b>Fire hazard rating</b> - Verify fire hazard rating for plastic impregnated materials does not exceed 25	A	RA	—
		Submittal Process	<b>Certification</b> - Verify Cooling Technology Institute 201 certification of tower capability and performance is provided	A	RA	—
		Submittal Process	<b>Cooler performance</b> - Verify meets or exceeds that listed in ASHRAE 90.1	A	RA	—
		Submittal Process/ Field Visit	<b>Hardware</b> - Verify stainless steel hardware provided	A	RA/ QA	—
		Submittal Process	<b>Vibration cutout switch</b> - Verify interlocked with fan motor	A	RA	—
		Submittal Process	<b>Fan motors</b> - Verify 2-speed or adjustable frequency drive fan motors provided	A	RA	—
		Field Visit	<b>Safety</b> - Verify OSHA safety requirements for stairs and handrails are met	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment & Controls	Chiller Systems Water Cooled Chillers	Submittal Process	<b>Construction and rating</b> - Verify self-contained chiller provided meeting requirements of ARI 550/590-98	A	RA	—
		Field Visit	<b>Control panel</b> - Verify provided with manufacturer's standard controls and protection circuits	A	QA	—
		Submittal Process/ Field Visit	<b>DDC system</b> - If DDC system required in project, verify control interface provided for remote monitoring of chiller's operating parameters, functions, and alarms from DDC control system central workstation	A	RA/ QA	QA
		Submittal Process	<b>Automatic capacity-reduction system</b> - Verify provided for stable operation from 100 to 10 percent of full load capacity	A	RA	—
	Chiller Systems Air Cooled	Submittal Process	<b>Construction and rating</b> - Verify provided air-cooled chillers are type indicated in Project Program and meet requirements of ARI 550/590-98	A	RA	—
		Submittal Process	<b>Control panel</b> - Verify provided with manufacturer's standard controls and protection circuits	A	RA	—
		Submittal Process/ Field Visit	<b>DDC System</b> - If DDC system required in project, verify control interface provided for remote monitoring of chiller's operating parameters, functions, and alarms from DDC control system central workstation	A	RA/ QA	QA
		Submittal Process	<b>Reciprocating chillers</b> - Verify minimum of four stages of unloading provided at 25% per stage minimum	A	RA	—
		Submittal Process	<b>Reciprocating chillers</b> - Verify provided with hot gas bypass	A	RA	—
		Submittal Process	<b>Head pressure control</b> - Verify provided for cold temperature operation	A	RA	—
		Submittal Process/ Field Visit	<b>Freeze protection</b> - Verify provided for chiller and piping	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Condenser coils</b> - Verify provided are copper tube with aluminum fins unless specified otherwise	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Condenser coils</b> - If condenser coil coatings indicated in ESR Section D30, verify provided with copper tube/ copper fin construction or immersion applied, baked phenolic, or other approved coating. Field applied coatings not acceptable.	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Condenser coils</b> - Verify condenser coils provided with manufacturer's optional louvered covers or hail guards for protection against vandalism, debris, or hail	A	RA/ QA	—
	Cooling Tower	Field Visit	Confirm tower size HP, voltage per contract docs	A	QA	QA
		Submittal Process/ Field Visit	Confirm tower constructed in accordance with specs (ie: galvanized, stainless steel, fiber-glass)	A	RA/ QA	QA
		Submittal Process/ Field Visit	<b>Sump</b> - Confirm height of cooling tower sump is above intake of condenser water pumps (min of 3 to 4 feet)	A	RA/ QA	QA

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment & Components (continued)		Submittal Process/ Field Visit	Confirm return line to tower has trap leg below well unless the by-pass is piped directly to cooling tower well	A	RA/ QA	QA
		Field Visit	<b>Overflow</b> - Confirm tower well overflow is low enough to prevent the well from overflowing	A	QA	QA
		Field Visit	<b>Make-up Float</b> - Confirm tower well make-up float setting shuts of prior to water level reaching the top of the overflow	A	QA	QA
		Field Visit	<b>Fan Rotation</b> - Confirm tower fan rotation is correct	A	QA	QA
		Field Visit	<b>Well Heater</b> - Confirm tower well heater is installed, if req	A	QA	QA
		Field Visit	<b>Shut-off Valve</b> - Confirm tower shut-off valve has been installed in proper location, if req	A	QA	QA
		Field Visit	<b>Fan Discharge</b> - Confirm tower fan discharge is unobstructed from above	A	QA	QA
		Field Visit	<b>Heat Trace</b> - Confirm tower piping above grade is heat traced, if req	A	QA	QA
		Submittal Process	<b>Construction and rating</b> - Confirm provided is factory assembled conforming to NFPA 214	A	RA	—
		Submittal Process	<b>Fire hazard rating</b> - Confirm fire hazard rating for plastic impregnated materials does not exceed 25	A	RA	—
		Submittal Process	<b>Certification</b> - Verify Cooling Technology Institute 201 certification of tower capability and performance is provided	A	RA	—
		Submittal Process	<b>Cooling tower performance</b> - Verify meets or exceeds that listed in ASHRAE 90.1	A	RA	—
		Submittal Process/ Field Visit	<b>Construction</b> - Verify construction is as indicated in ESR Section D30 with fill material of PVC formed sheets	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Hardware</b> - Verify stainless steel hardware provided	A	RA/ QA	—
		Submittal Process	<b>Vibration cutout switch</b> - Verify interlocked with fan motor	A	QA	—
		Submittal Process	<b>Fan motors</b> - Verify 2-speed or adjustable frequency drive fan motors provided	A	QA	—
		Submittal Process/ Field Visit	<b>Work platforms</b> - Verify provided at all locations in tower that require periodic maintenance	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Isolation valves</b> - For multi-cell installations, verify isolation valves provided on inlets and outlets of each cell	A	RA/ QA	—
	Fan Coil Units	Field Visit	Confirm size and location in accordance with contract docs	A	QA	QA
		Field Visit	<b>Filter Access</b> - Confirm filter accessibility	A	QA	QA
		Field Visit	Confirm vibration isolation provided for on hangers and at ductwork connection	A	QA	QA
		Field Visit	Confirm installation of auxilliary drain pan (if req) along with respective condensate drain piping	A	QA	QA

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>		Field Visit	Confirm valves arranged properly including the straight pipe diameters req before and after the balancing valve	A	QA	QA
		Submittal Process/ Field Visit	<b>Speed Controller</b> - Confirm speed controller has been provided, if req in contract docs	A	RA/ QA	QA
		Field Visit	<b>Fan Access</b> - Confirm fan access is accessible by maintenance staff	A	QA	QA
		Field Visit	Confirm unit tagging has been provided	A	QA	—
		Field Visit	Confirm operational	A	QA	—
		Submittal Process/ Field Visit	<b>Sensors</b> - Confirm leaving air temp sensor has been provided	A	RA/ QA	QA
		Submittal Process	Verify provided are UL-Listed, factory assembled and tested fan coils, ARI 440, and ARI certified	A	QA	—
	<b>Thru Wall Classroom Terminal Units</b>	Field Visit	Confirm size and location in accordance with contract docs	A	QA	QA
		Field Visit	Confirm operational	A	QA	—
		Field Visit	Confirm piping arrangement meets contract docs req's	A	QA	QA
	<b>Packaged Thru Wall Units</b>	Submittal Process	Verify provided is factory assembled air conditioner or heat pump and rated in accordance with ARI 310 or ARI 380 and ARI certified	A	RA	—
		Submittal Process	Verify provided unit includes heat and operates under the standard unit controls (Not sure if worded correctly, D305006 1.4)	A	RA	—
		Submittal Process	<b>Wall Sleeve</b> - Verify unit designed to allow ease of maintenance by use of a wall sleeve	A	RA	QA
		Submittal Process/ Field Visit	<b>Condensate Removal</b> - Verify provided unit includes internal condensate removal (condensate shall not be externally drained)	A	RA/ QA	QA
	<b>Room Air Conditioners</b>	Submittal Process	Verify provided is factory assembled air conditioner or heat pump and rated in accordance with AHAM RAC-1	A	RA	—
		Submittal Process/ Field Visit	Verify auxiliary electric heat included and operates under the standard unit controls	A	RA/ QA	QA
		Submittal Process	Verify provided unit is AHAM certified or listed in AHAM DCRAC	A	RA	—
	<b>Computer Room Units</b>	Field Visit	Confirm size and location	A	QA	QA
		Field Visit	Confirm all features have been provided	A	QA	QA
		Field Visit	Confirm water connection to humidifier	A	QA	QA
		Field Visit	<b>Fan Rotation</b> - Confirm fan rotation	A	QA	QA
		Submittal Process	If computer room unit req'd, verify DOR utilized UFGS Spec section 23 81 23.00 20 (Computer Room Air Conditioning Units) for the project spec and submitted the edited spec section as part of the design submittal for the project	A	RA	—
	<b>Boilers</b>	Field Visit	Confirm size and location	A	QA	—
		Field Visit	<b>Stack</b> - Confirm stack material and arrangement meet contract doc req's	A	QA	QA

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# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
		Field Visit	<b>Stack</b> - Confirm stack above roof does not touch roof curb and guy wires have been provided	A	QA	QA
		Field Visit	<b>Stack</b> - Confirm stack type is per contract docs and the height above the parapet and/or building meets code req's	A	QA	QA
		Field Visit	Confirm fuel train meets contract docs and code req's with no leaks	A	QA	QA
		Submittal Process/ Field Visit	<b>Make-up Air</b> - Confirm adequate make-up air for the boiler(s) has been provided under positive pressure to the room	A	RA/ QA	QA
		Field Visit	<b>Relief Valve</b> - Confirm relief valve setting and operation	A	QA	—
		Field Visit	<b>DDC</b> - Confirm boilers have been interfaced with the DDC system	A	QA	QA
		Field Visit	Confirm pump/piping arrangement meets contract docs including circulation pump, if req	A	QA	QA
		Submittal Process/ Field Visit	Confirm boiler sequencing panel has been provided by the boiler manufacturer, if req in the contract docs	A	RA/ QA	QA
	<b>Boilers - Hot Water</b>	Submittal Process	<b>Load capacity</b> - Verify boiler type provided meets building load capacity as indicated in ESR Section D30, if required	A	RA	—
		Submittal Process/ Field Visit	<b>Construction and rating</b> - Verify boiler designed, tested, and installed per ASME CSD-1 (Controls and Safety Devices) and ASME BPVC (Boiler and Pressure Vessel Code)	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Construction</b> - Verify boiler meets requirements of UL 795, ANSI Z83.3, and ASME CSD	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Burners</b> - Confirm provided are make, model, and type certified and approved by manufacturer of provided boiler	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify burner controls and flame safety equipment conform to either ASME CSD-1 or NFPA 58 as dictated by input	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Boiler controls</b> - Verify are mounted on a single control panel mounted on the burner or separate from the burner (includes operating switches, indicating lights, gages, alarms, motor starters, fuses, and circuit elements of the control system). If separa	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Trim</b> - Verify boiler trim complies with ASME BPVC SEC IV, ASME CSD-1, and additional appurtenances as specified herein	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Pressure gages</b> - Confirm provided have scale equivalent to 1.5 times the outlet water pressure on supply water piping and return water piping	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Thermometers - Piping</b> - Confirm provided have scale equivalent to 1.5 times the outlet water temperature on supply water piping and return water piping	A	RA/ QA	—
		Field Visit	<b>Drain valve</b> - Verify provided and piped to floor drain	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<i>System</i>	<i>Sub-Systems</i>	<i>Phase</i>	<i>Elements</i>	<i>ME QC / DOR (Ktr)</i>	<i>FEAD (SIOH)</i>	<i>FEC (PCAS)</i>
<b>Equipment &amp; Components (continued)</b>		Submittal Process/ Field Visit	<b>Air vent valve</b> - Verify provided with screwed connection, stainless steel disk, and stainless steel seats to vent entrapped air	A	RA/ QA	—
		Submittal Process	<b>Boiler stack</b> - Verify provided boiler stack insulated in accordance with manufacturer's recommendations and conform to NFPA 211, or pre-manufactured multi-wall stacks provided complying with NFPA 54 or NFPA 58 and UL-listed	A	RA	—
		Submittal Process/ Field Visit	<b>Thermometer - Flue gas</b> - Verify provided and mounted in flue gas outlet	A	RA/ QA	—
		Field Visit	<b>Cleaning</b> - Verify boiler(s) cleaned in accordance with ASME Boiler and Pressure Vessel Code and manufacturer's recommendations prior to startup	A	QA	—
		Field Visit	<b>Testing</b> - Verify services are furnished of an engineer or technician approved by the boiler manufacturer for installation, startup, and operational and safety testing	V	W	W
		Field Visit	<b>Testing</b> - Verify boiler demonstrates proper operability of combustion control, flame safeguard control, and safety interlocks	V	W	W
	<b>Boilers - Steam</b>		<b>Confirm meets same requirements specified for hot water boilers except as follows:</b>			
		Submittal Process/ Field Visit	<b>Pressure gage</b> - Confirm provided have scale equivalent to 1.5 times the outlet water pressure on boiler feedwater supply piping and condensate return water piping	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Pressure gage</b> - Confirm provided boiler steam pressure gage has scale equivalent to 1.5 times the boiler rated working pressure	A	RA/ QA	—
		Submittal Process/ Field Visit	<b>Thermometers - Piping</b> - Confirm provided have scale equivalent to 1.5 times the outlet water temperature on boiler feedwater piping and return water piping	A	RA/ QA	—
	<b>Insulation - Condensate Drain</b>	Field Visit	<b>Insulation</b> - Verify condensate drain piping insulated with flexible cellular insulation	A	QA	—
	<b>Insulation</b>	Field Visit	Verify all ductwork provided with external thermal insulation	A	QA	—



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment & Components (continued)		Field Visit	Verify all ductwork in concealed spaces insulated with blanket flexible mineral fiber	A	QA	—
		Field Visit	Verify ductwork in mechanical Rooms and exposed locations insulated with rigid mineral fiber insulation	A	QA	—
		Field Visit	Verify insulation provided with factory applied all-purpose jacket with integral vapor retarder	A	QA	—
		Field Visit	In exposed locations, verify jacket provided with white surface suitable for painting	A	QA	—
		Submittal Process/ Field Visit	Verify flame spread/smoke developed rating for all insulation does not exceed 25/ 50	A	RA/ QA	—
		Submittal Process	Verify minimum insulation thickness does not violate minimum required by ASHRAE 90.1	A	RA	—
		Field Visit	Verify the backs of all supply air diffusers insulated with blanket flexible mineral fiber insulation	A	QA	QA
	VFDs	Submittal Process/ Field Visit	Verify are factory-assembled VFD drive control systems for variable speed control	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify all AHU and pump VFD's are from same manufacturer	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify each VFD provided includes motor starter, motor disconnects, and controls as required for a complete system	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify VFD units provided are UL-Listed and comply with the National Electric Code	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify the following accessories were provided: Disconnect switch, Control circuit transformer with primary and secondary fuses, Manual bypass, System hand-off-auto switch with provisions for remote start/stop of the system, System initialized light, Run	A	RA/ QA	QA
	Air Separators	Submittal Process/ Field Visit	<b>For hot and chilled water</b> - Verify provided are ASME rated air separators with tangential inlet and outlet connections and automatic air vent	A	RA/ QA	—
	Solids Separators	Submittal Process/ Field Visit	Verify provided are centrifugal solids separators with automatic drain in open systems.	A	RA/ QA	—
	Expansion Tanks	Submittal Process/ Field Visit	For hot and chilled water - Verify provided are ASME rated expansion tanks with polypropylene or butyl diaphragm or compression tanks as indicated in UFC 3-400-10N.	A	RA/ QA	—
	Make-Up Water Station	Field Visit	Verify station consists of a water pressure-reducing valve, filter, and relief valve in the make-up water line to the chilled and hot water systems to maintain the operating pressure	A	QA	—
		Field Visit	Verify a 20mm (3/4 inch) globe valve by-pass provided around the pressure reducing station	A	QA	—
		Field Visit	Verify a reduced pressure backflow preventer provided upstream of the by-pass	A	QA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>ent &amp; Components (continued)</b>	<b>Glycol Make-Up Station</b>	Submittal Process/ Field Visit	If required, verify a glycol make-up system provided to maintain system proper operating mixture	A	RA/ QA	—
	<b>Chemical Treatment</b>	Submittal Process/ Field Visit	If required, verify chilled and hot water systems provided with automatic chemical treatment system for the control of pH, scale formation, and corrosion inhibition	A	RA/ QA	—
		Field Visit	Verify shot-type feeders provided for manual chemical feed	A	QA	—
		Submittal Process	Verify feeders rated for use with pressures up to 900 kPa (130 PSI) (gage)	A	RA	—
		Submittal Process/ Field Visit	Verify condenser water systems provided with automatic chemical treatment systems that monitor conductivity, pH, etc, and provide for water metering and bleed-off	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify chemicals provided are in accordance with EPA and equipment manufacturer's recommendations	A	RA/ QA	—
	<b>System Flushing</b>	Field Visit	Verify hydronic systems flushed thoroughly prior to system startup	A	QA	—
	<b>Heat Tape</b>	Submittal Process/ Field Visit	Verify heat tape provided is UL-Listed, and self-regulating	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify heat tape provided on piping subject to freezing	A	RA/ QA	QA
	<b>Terminal &amp; package Units</b>	Submittal Process/ Field Visit	Where required in ESR Section D30, verify anti-corrosion coating provided on the casing and both the condenser and evaporator coils to protect against salt air damage	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify anti-corrosion coating is immersion applied, baked phenolic or other approved coating (Field applied coatings are not acceptable)	A	RA/ QA	—
	<b>Seismic Design</b>	Submittal Process	Verify provided in accordance with UFC 3-400-10N, Mechanical Engineering	A	RA	—
	<b>Energy Recovery Wheel (Enthalpy Wheel)</b>	Field Visit	Verify provided is a total energy (enthalpy) type energy recovery wheel (heat wheel)	A	QA	—
		Submittal Process/ Field Visit	<b>Media</b> - Verify media is aluminum or a lightweight polymer coated with a corrosion resistance finish (Etched or oxidized surfaces are not acceptable)	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify heat transfer surfaces are coated with a non-migrating (permanently bonded) absorbent specifically developed for the selective transfer of water vapor	A	RA/ QA	—
		Submittal Process	Verify equal sensible and latent recovery efficiencies are documented through a certification program conducted per ASHRAE 84 and ARI 1060	A	RA	—



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
Equipment		Submittal Process/ Field Visit	Verify energy recovery wheel provided with insulating housing of double wall construction, rotor seals specifically designed to limit cross-contamination, and a rotation detector	A	RA/ QA	—
		Field Visit	Verify the rotation detector alarms the HVAC control system if rotation stops	A	QA	—
		Field Visit	<b>Filter Access</b> - Verify filter sections are readily accessible for maintenance	A	QA	QA
	Heat Pipes	Submittal Process	Verify provided are factory fabricated, assembled and tested heat pipes with counter-flow arrangement	A	RA	—
		Submittal Process	Verify are provided with hermitically sealed, seamless aluminum tube cores with extended surfaces	A	RA	—
		Submittal Process	Verify heat exchanger frame constructed of not less than 16-gage galvanized steel and fitted with intermediate tube supports and flange connections	A	RA	—
		Submittal Process	Verify tube end covers and a partition of galvanized steel provided to separate exhaust and supply air streams without cross-contamination	A	RA	—
		Submittal Process	<b>Refrigerant</b> - Verify refrigerant used as the working fluid (Type I refrigerants are not allowed)	A	RA	—
	Exterior Piping Manholes	Submittal Process/ Field Visit	<b>Manholes</b> - Verify system manholes are constructed of reinforced, 206.8 bar (3000 psi) concrete. Verify manhole floor and sides are watertight and were made in one monolithic pour. Verify manhole top extends a minimum of 300 mm (6 inches) above grade. V	A	RA/ QA	—
		Submittal Process	Verify a sump pit and a vertical sump pump designed for an operating temperature design of 93 degrees C (195 degrees F) minimum are provided in each system manhole.	A	RA	—
		Submittal Process	<b>Sump Pump - Float Control</b> - Verify a 2-pole float control is provided for each manhole sump pump.	A	RA	—
	Exterior Piping Cathodic Protection	Field Visit	If underground steel piping is installed, verify a cathodic protection system is provided.	A	QA	—
		Submittal Process	If a cathodic protection system is provided, verify the system was designed by a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Engineer and they supervised, inspected and tested the installation and performance of the ca	A	QA	QA
		Field Visit	Verify the test stations were post mounted and placed at the manhole or nearby building and test stations were provided at each end of each cathodically protected section.	A	QA	—
	DDC		Verify one of the following provided as directed in ESR Section D30			
		Submittal Process	A) Verify Direct Digital Controls (DDC) provided to comply with UFGS Section 23 09 54.00 20, Direct Digital Control Systems	A	RA	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Equipment &amp; Components (continued)</b>		Submittal Process	A) Verify DOR utilized UFGS Spec Section 23 09 54.00 20, Direct Digital Control Systems, for the project spec, and submitted the edited spec section as part of the design submittal for the project	A	RA	—
		Submittal Process/ Field Visit	B) Verify a partial DDC system provided that communicates with the existing DDC system	A	RA/ QA	—
		Submittal Process	B) Notwithstanding any other provisions of this contract, no other product will be acceptable other than that indicated in ESR Section D30	A	RA	—
		Submittal Process/ Field Visit	B) Verify the system has stand alone digital controllers, a communication network, and a workstation computer with control software (Pneumatic controllers and components are not acceptable)	A	RA/ QA	—
		Submittal Process	B) Verify all 120-volt wiring complies with NFPA 70	A	RA	—
		Submittal Process/ Field Visit	B) Verify all 24-volt wiring complies with the IMC and terminal device manufacturer's recommendations	A	RA/ QA	—
	<b>DDC - Equipment Controllers</b>	Submittal Process/ Field Visit	Verify DDC hardware are UL-916 rated	A	RA/ QA	—
		Submittal Process/ Field Visit	Verify controllers used in a distributed control manner	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify controllers are stand alone with an internal clock and modem	A	RA/ QA	QA
		Submittal Process	Verify the total number of I/O hardware points do not exceed 48 in any controller	A	RA	QA
		Submittal Process	Verify sufficient memory provided for each controller to support required control, communication, trends, alarms, and messages	A	RA	QA
		Submittal Process/ Field Visit	Verify communications ports provided for controller to controller, on-site interface, remote workstation interface, and telecommunications interface	A	RA/ QA	QA
	<b>DDC - Electronic Controls</b>	Submittal Process/ Field Visit	If required, verify programmable thermostats provided with built in keypads for scheduling of day and night temps with two setback periods per day	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify independent summer and winter programs provided	A	RA/ QA	QA
		Submittal Process/ Field Visit	Verify thermostats have temporary and manual override of schedule and battery backup	A	RA/ QA	QA
	<b>All Submittals</b>	Submittal Process	All equipment and controls hardware reviewed by A/E	A	RA	RA
	<b>DALTS - Submittals</b>	Submittal Process	TAB contractor qualifications & certification	RA	RA	A
		Submittal Process	DALT test equip with certification	RA	RA	A

KEY = A - Approve, R - Review, W - Witness, RA - Receipt Acknowledge, S - Surveillance Review, V- Verification and Testing, C - Copy, QA - Quality Assurance

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
		Submittal Process	DALT test plan	RA	RA	A
		Submittal Process	DALT tests report including plan drawing of duct to be tested and square foot calc for each section	RA	RA	A
		<b>DALTS - Testing</b>				
		Submittal Process	Ductwork to be DALT'd	RA	RA	A
		Field Visit	Testing	V	W	W
		Submittal Process	Pre-final DALT report	RA	C	A
		Submittal Process	Certified final DALT report	RA	C	A
	<b>DALTS - Acceptance Testing</b>					
		Field Visit	Quality assurance - Contracting officer DALT field checks	V	W	W
		Field Visit	Additional field checks	V	W	W
	<b>TABS - Submittals</b>					
		Submittal Process	TAB contractors qualifications & certification	RA	RA	A
		Submittal Process	Pre-TAB engineering report	RA	RA	A
		Submittal Process	*Discussion on TAB procedure	RA	RA	A
		Submittal Process	*Pre-requisite checklist	RA	RA	A
		Submittal Process	*Design review report	RA	RA	A
		Submittal Process	*Preliminary TAB test report	RA	RA	A
		Submittal Process	Certified TAB test report (Season 1)	RA	RA	A
		Submittal Process	Certified TAB test report (Season 2 (coil data))	RA	RA	A
	<b>TABS - Pre-Test Checklist</b>		<b>1) Variable Air Volume Series Boxes</b>			
			<b>a) General</b>			
		Field Visit	Louvers installed	V	W	—
		Field Visit	Manual dampers open and locked	V	W	—
		Field Visit	Automatic dampers set properly	V	W	—
		Field Visit	Housing construction leakage	V	W	—
		Field Visit	Access doors per plans & specs.	V	W	—
		Field Visit	Condensate drain piping & pan	V	W	—
		Field Visit	Free from dirt & debris	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>b) Filters</b>			
		Field Visit	Type / size / number correct	V	W	—
		Field Visit	Clean	V	W	—
		Field Visit	Blank-off plates installed	V	W	—
		Field Visit	Frame leakage at a minimum	V	W	—
			<b>c) Coils (Hydronic – Water / Steam)</b>			
		Field Visit	Size & rows	V	W	—
		Field Visit	Fin spacing & condition	V	W	—
		Field Visit	Obstructions and/or debris	V	W	—
		Field Visit	Correct air flow direction	V	W	—
		Field Visit	Correct piping connections / flow	V	W	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
		Field Visit	Valves open & set	V	W	—
		Field Visit	Vents / traps installed correctly	V	W	—
		Field Visit	Provisions for TAB measurements	V	W	—
			<b>d) Coils (Electric)</b>			
		Field Visit	Size & construction	V	W	—
		Field Visit	Airflow direction	V	W	—
		Field Visit	Duct connections	V	W	—
		Field Visit	Safety switches	V	W	—
		Field Visit	Obstructions	V	W	—
		Field Visit	Free from debris	V	W	—
		Field Visit	Contractors & disconnect switches	V	W	—
		Field Visit	Electrical service & connections	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>e) Fans</b>			
		Field Visit	Rotation	V	W	—
		Field Visit	Wheel clearance & balance	V	W	—
		Field Visit	Bearing & motor lubrication	V	W	—
		Field Visit	Drive alignment	V	W	—
		Field Visit	Belt tension	V	W	—
		Field Visit	Drive set screws tight	V	W	—
		Field Visit	Belt guards in place	V	W	—
		Field Visit	Flex duct connector alignment	V	W	—
		Field Visit	Proper unit / duct alignment	V	W	—
		Field Visit	Starters & disconnect switches	V	W	—
		Field Visit	Electrical service & connections	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>f) Vibration isolation</b>			
		Field Visit	Springs & compression	V	W	—
		Field Visit	Base level & free	V	W	—
			<b>2) DUCT SYSTEMS</b>			
			<b>a) General</b>			
		Field Visit	Manual damper positioned & locked	V	W	—
		Field Visit	Damper adjustments accessible	V	W	—
		Field Visit	Access doors closed & tight	V	W	—
		Field Visit	Fire dampers open & accessible	V	W	—
		Field Visit	Terminal units open & set	V	W	—
		Field Visit	Registers/diffusers wide open & set	V	W	—
		Field Visit	Turning vanes in square elbows	V	W	—
		Field Visit	Provisions made for TAB tests	V	W	—
		Field Visit	System installed per plans & specs.	V	W	—
		Field Visit	All ductwork sealed as required	V	W	—
			<b>b) Architectural</b>			
		Field Visit	Windows installed & closed	V	W	—
		Field Visit	Doors closed as required	V	W	—
		Field Visit	Ceiling plenums installed/sealed	V	W	—
		Field Visit	Access doors closed & tight	V	W	—
		Field Visit	Air shafts/openings as required	V	W	—
			<b>3) PUMPS</b>			
			<b>a) Motors</b>			
		Field Visit	Rotation	V	W	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
System Acceptance (continued)		Field Visit	Lubrication	V	W	—
		Field Visit	Alignment	V	W	—
		Field Visit	Set screws tight	V	W	—
		Field Visit	Guards in place	V	W	—
		Field Visit	Tank level and controls	V	W	—
		Field Visit	Starters & disconnects	V	W	—
		Field Visit	Electrical service & connections	V	W	—
			<b>b) Piping</b>			
		Field Visit	Correct flow	V	W	—
		Field Visit	Correct connections	V	W	—
		Field Visit	Leakage	V	W	—
		Field Visit	Valves positioned & set	V	W	—
		Field Visit	Strainers clean	V	W	—
		Field Visit	Air Vented	V	W	—
		Field Visit	Flexible connectors installed	V	W	—
		Field Visit	Provisions made for TAB tests	V	W	—
		Field Visit	System water clean	V	W	—
			<b>c) Bases</b>			
		Field Visit	Vibration isolation	V	W	—
		Field Visit	Grouting (if required)	V	W	—
		Field Visit	Leveling	V	W	—
			<b>4) HYDRONIC EQUIPMENT</b>			
			<b>a) Boilers</b>			
		Field Visit	Operating controls & devices	V	W	—
		Field Visit	Safety controls & devices	V	W	—
		Field Visit	Lubrication of fans & pumps	V	W	—
		Field Visit	Draft controls & devices	V	W	—
		Field Visit	Piping controls & devices	V	W	—
		Field Visit	Valves set & open	V	W	—
		Field Visit	Water make-up provisions	V	W	—
		Field Visit	Blowdown provisions	V	W	—
		Field Visit	Electrical connections	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>b) Heat Exchangers</b>			
		Field Visit	Correct flow & connections	V	W	—
		Field Visit	Valves open or set	V	W	—
		Field Visit	Air vents or steam traps	V	W	—
		Field Visit	Leakage	V	W	—
		Field Visit	Provisions made for TAB tests	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>c) Cooling Towers/Evaporative Condensers</b>			
		Field Visit	Correct flow & connections	V	W	—
		Field Visit	Valves open or set	V	W	—
		Field Visit	Leakage	V	W	—
		Field Visit	Provisions made for TAB tests	V	W	—
		Field Visit	Sump water level	V	W	—
		Field Visit	Spray nozzles	V	W	—
		Field Visit	Fan/Pump rotation	V	W	—
		Field Visit	Motor/Fan lubrication	V	W	—
		Field Visit	Drives & alignment	V	W	—

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
System Acceptance (continued)		Field Visit	Guards in place	V	W	—
		Field Visit	Starters & disconnects	V	W	—
		Field Visit	Electrical connections	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>5) REFRIGERANT EQUIPMENT</b>			
		Field Visit	Crankcase heaters energized	V	W	—
		Field Visit	Operating controls & devices	V	W	—
		Field Visit	Safety controls & devices	V	W	—
		Field Visit	Valves open	V	W	—
		Field Visit	Piping connections & flow	V	W	—
		Field Visit	Flexible connectors	V	W	—
		Field Visit	Oil level & lubrication	V	W	—
		Field Visit	Alignment & drives	V	W	—
		Field Visit	Guards in place	V	W	—
		Field Visit	Vibration isolation	V	W	—
		Field Visit	Starters/Contactors/Disconnects	V	W	—
		Field Visit	Electrical connections	V	W	—
		Field Visit	Nameplate data clearly visible	V	W	—
			<b>6) HYDRONIC PIPING SYSTEM</b>			
		Field Visit	Leak tested	V	W	—
		Field Visit	Fluid levels & make-up	V	W	—
		Field Visit	Relief or safety valves	V	W	—
		Field Visit	Expansion tanks & air vents	V	W	—
		Field Visit	Steam traps & connections	V	W	—
		Field Visit	Strainers clean	V	W	—
		Field Visit	Valves open & set	V	W	—
		Field Visit	Provisions made for TAB tests	V	W	—
		Field Visit	Systems installed per plans & specs.	V	W	—
			<b>7) CONTROLS &amp; CONTROL SYSTEMS</b>			
		Field Visit	Data centers	V	W	—
		Field Visit	Outdoor/return Air/reset	V	W	—
		Field Visit	Economizer set & tested	V	W	—
		Field Visit	AHU Static pressure set	V	W	—
		Field Visit	Room controls calibrated	V	W	—
		Field Visit	VAV box regulators set to design	V	W	—
		Field Visit	VAV box P.E. switches set	V	W	—
		Field Visit	Proper end-of-line static pressure	V	W	—
		Field Visit	VAV box reheats tested	V	W	—
			<b>8) OTHER CHECKS</b>			
		Submittal Process	Appropriate contractors notified of TABS	A	RA	S
		Submittal Process	Preliminary data complete	A	RA	S
		Submittal Process	Test report forms prepared	S	RA	A

# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>ME QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
	<b>TABS - Testing</b>	Field Visit	TAB field work	V	W	
		Submittal Process	Preliminary procedures	RA	C	A
		Field Visit	TAB air distribution systems	V	W	—
		Field Visit	TAB water distribution systems	V	W	—
		Field Visit	Sound measurement work	V	W	—
		Field Visit	TAB work on performance tests without seasonal limitations	V	W	—
		Field Visit	TAB work on performance tests with seasonal limitations	V	W	—
		Field Visit	Marking settings	V	W	—
		Field Visit	Marking of test ports	V	W	—
	<b>TABS - Acceptance Testing</b>	Field Visit	Quality assurance - Contracting officer TAB field checks	V	W	W
		Field Visit	Additional field checks	V	W	W
	<b>ACATS - Submittals</b>	Submittal Process	Controls contractor qualifications	RA	RA	A
		Submittal Process	Manufacturers field report	RA	RA	A
		Submittal Process	Performance verification test plan (PVT)	RA	RA	A
		Submittal Process	Pre-PVT checklist	RA	RA	A
		Submittal Process	Final certified PVT report (with all mods incorporated in as-builts)	RA	RA	A
	<b>ACATS - Pre-PVT Checklist</b>	Field Visit	Prior to conducting the PVT, thoroughly inspect the installed work with the Contractor's QC representative and the mechanical contractor using the following checklist. Submit the checklist with items checked off once verified. Provide a detailed explana	V	W	—
		Field Visit	a. Verify all required mechanical installation work is successfully completed, and all HVAC equipment is working correctly (or will be by the time the PVT is conducted).	V	W	—
		Field Visit	b. Verify HVAC motors operate below full-load amperage ratings.	V	W	—
		Field Visit	c. Verify all required control system components, wiring, and accessories are installed.	V	W	—
		Field Visit	d. Verify the installed control system architecture matches approved drawings.	V	W	—
		Field Visit	e. Verify all control circuits operate at the proper voltage and are free from grounds or faults.	V	W	—
		Field Visit	f. Verify all required surge protection is installed and functions correctly.	V	W	—
		Field Visit	g. Verify the A/C Power Table specified in "CONTROLS SYSTEM OPERATORS MANUALS" is accurate.	V	W	—



# MECHANICAL ENGINEERING ROLES and RESPONSIBILITIES

System	Sub-Systems	Phase	Elements	ME QC / DOR (Ktr)	FEAD (SIOH)	FEC (PCAS)
System Acceptance (continued)		Field Visit	h. Verify all DDC network communications function properly, including uploading and downloading programming changes.	V	W	—
		Field Visit	i. Using the BACnet protocol analyzer (if provided or required in this specification), verify communications are error free.	V	W	—
		Field Visit	j. Verify each digital controller's programming is backed up.	V	W	—
		Field Visit	k. Verify all wiring, components, and panels are properly labeled.	V	W	—
		Field Visit	l. Verify all required points are programmed into devices.	V	W	—
		Field Visit	m. Verify all TAB work affecting controls is complete.	V	W	—
		Field Visit	n. Verify all valve and actuator zero and span adjustments are set properly.	V	W	—
		Field Visit	o. Verify all sensor readings are accurate and calibrated.	V	W	—
		Field Visit	p. Verify each control valve and actuator goes to normal position upon loss of power.	V	W	—
		Field Visit	q. Verify all control loops are tuned for smooth and stable operation. View trend data where applicable.	V	W	—
		Field Visit	r. Verify each controller works properly in stand-alone mode.	V	W	—
		Field Visit	s. Verify all safety controls and devices function properly, including interfaces with building fire alarm systems.	V	W	—
		Field Visit	t. Verify all electrical interlocks work properly.	V	W	—
		Field Visit	u. Verify all workstations, notebooks and maintenance personnel interface tools are delivered, all system and database software is installed, and graphic pages are created for each workstation and notebook. Notify the Government when phone lines or netw	V	W	—
		Field Visit	v. Verify the as-built (shop) control drawings are completed.	V	W	—
	ACATS - Testing	Field Visit	Field testing of components	V	W	—
		Field Visit	Field testing of programming	V	W	—
		Field Visit	Pre-performance verification testing	V	W	—
	ACATS - Acceptance Testing	Field Visit	Performance verification testing	V	W	W
		Field Visit	Performance verification re-resting	V	W	W



## ROOFING ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>Roof QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC (PCAS)</b>
<b>Roofing</b>	<b>Low Sloped Roofs</b>	Design Guidance	Post Award Kick Off Meeting		S	A
		Design Guidance	Verify Roof Design Assurance	A	R	S
		Submittal Process	Review Shop Drawings	A	S	S
		Submittal Process	Review Manufacturer's Product Data Sheets	A	S	S
		Submittal Process	Review Design Data ( to include wind and fire resistance)	A	S	S
		Submittal Process	Review Test Reports	A	S	S
		Submittal Process	Review Certificates	A	S	S
		Submittal Process	Review Sample Roof Warranty	A	S	C
		Field Visit	Conduct Pre Roofing Conference	V	S	S
		Field Visit	Review Delivery, Storage, and Handling	A	S	S
		Field Visit	Verify Conditions for roof application	A	S	S
		Field Visit	Verify Preparation	A	S	S
		Field Visit	Verify Application	A	S	S
		Field Visit	Verify Protection of Applied Roofing	A	S	S
		Field Visit	Verify Field Quality Control	A	S	S
		Field Visit	Verify Operation Maintenance and Support Information (Roof Warranty and Information Card)	A	S	S
	<b>Steep Sloped Roofs</b>	Design Guidance	Post Award Kick Off Meeting		S	A
		Design Guidance	Verify Roof Design Assurance	A	R	S
		Submittal Process	Review Shop Drawings	A	S	S
		Submittal Process	Review Manufacturer's Product Data Sheets	A	S	S
		Submittal Process	Review Design Data ( to include wind and fire resistance)	A	S	S
		Submittal Process	Review Test Reports	A	S	S
		Submittal Process	Review Certificates	A	S	S
		Submittal Process	Review Sample Roof Warranty	A	S	C
		Field Visit	Conduct Pre Roofing Conference	V	S	S
		Field Visit	Review Delivery, Storage, and Handling	A	S	S
		Field Visit	Verify Conditions for roof application	A	S	S
		Field Visit	Verify Preparation	A	S	S
		Field Visit	Verify Application	A	S	S
		Field Visit	Verify Protection of Applied Roofing	A	S	S
		Field Visit	Verify Field Quality Control	A	S	S
		Field Visit	Verify Operation Maintenance and Support Information (Roof Warranty and Information Card)	A	S	S

## UNDERWATER STRUCTURES ROLES and RESPONSIBILITIES

<b>System</b>	<b>Sub-Systems</b>	<b>Phase</b>	<b>Elements</b>	<b>UW QC / DOR (Ktr)</b>	<b>FEAD (SIOH)</b>	<b>FEC/NF ESC (PCAS)</b>
<b>Waterfront Structure H10 (Uniform II) - Substructure H1010</b>	<b>Pile Foundations (H101001) Sheet Piles (H101001) Caissons (H101001) Cofferdams (H101001) Wraps and Encasements (H101001) Sheet Pile Bulheads (H101003) Gravity Walls (H101003) Block Walls (H101003) Seawalls (H101006) Boat Ramps (H101007) Cut-Off Walls (H101008) Wave Attenuation Walls (H101009) Fender Piles (H104001) Dolphins (H104004)</b>	Submittal Process	Shop Drawings	A	C	S
		Submittal Process	Manufacturer's Data Sheets	A	C	S
		Submittal Process	Pile driving records	A	C	S
		Submittal Process	Concrete testing: petrographic, chemical, service-life modeling	A	C	S
		Submittal Process	As-built drawings, 3D AUTOCAD format	A	C	S
		Field Visit	Validate in-water/underwater structure complies with RFP requirements, e.g., number, location, size, etc.	A	—	W
		Field Visit	Inspect in-water prestressed/precast concrete piles or sheetpiles for alignment, spalls, cracks, damages, defects, lifting hoops cut/area patched, exposed steel ties, penetrations, etc.	A	—	W
		Field Visit	Inspect in-water cast-in-place concrete drilled caissons for alignment, spalls, cracks, damages, defects, concrete quality (hardness), honeycombing, etc.	A	—	W
		Field Visit	Inspect in-water steel piles and/or p/c p/s concrete sheetpiles for alignment, damage/buckling, coating damage, penetrations, gaps, etc.	A	—	W
		Field Visit	Inspect underwater concrete placement for defects such as honeycombing, concrete quality (hardness)	A	—	W
		Field Visit	Inspect underwater slope protection for conformance with RFP requirements such as rock/boulder size, placement gap limits, angle, location (e.g., toe of slope protection), consistency, etc.	A	—	W
		Field Visit	Inspect underwater Cathodic Protection anodes and connections	A	—	W
		Field Visit	Inspect for underwater debris, existing or by construction.	A	—	W
		Field Visit	Validate in-water/underwater structure complies with RFP requirements, e.g., number, location, size, etc.	A	—	W
		Field Visit	Validate in-water/underwater structure complies with RFP requirements, e.g., number, location, size, etc.	A	—	W
		Field Visit	Validate in-water/underwater structure complies with RFP requirements, e.g., number, location, size, etc.	A	—	W

## UNDERWATER STRUCTURES ROLES and RESPONSIBILITIES

<i>System</i>	<i>Sub-Systems</i>	<i>Phase</i>	<i>Elements</i>	<i>UW QC / DOR (Ktr)</i>	<i>FEAD (SIOH)</i>	<i>FEC/NF ESC (PCAS)</i>
<b>Underwater Cables</b>	<b>All</b>	Submittal Process	Shop Drawings	A	C	S
		Submittal Process	Manufacturer's Data Sheets	A	C	S
		Field Visit	Validate in-water/underwater cable complies with RFP requirements, e.g., number, location, size, etc.	A	—	W
		Field Visit	Inspect underwater cable for defects/damages, kinks, missing anchors, coating damage, etc.	A	—	W
		Field Visit	Inspect for underwater debris, existing or by construction.	A	—	W
<b>Underwater Utility Pipes and Conduits</b>	<b>All</b>	Submittal Process	Shop Drawings	A	C	S
		Submittal Process	Manufacturer's Data Sheets	A	C	S
		Field Visit	Validate in-water/underwater component complies with RFP requirements, e.g., number, location, size, etc.	A	—	W
		Field Visit	Inspect underwater component for defects/damages, cracks, missing anchors, coating damage, etc.	A	—	W
		Field Visit	Inspect for underwater debris, existing or by construction.	A	—	W

## DEFINITIONS

<b>A</b> pprove	(A)	Professional or quality control endorsement of the submittal or installed system meets the contract requirements
<b>R</b> everview	(R)	To confirm accuracy of the submittal and that it meets contract requirements
<b>W</b> itness	(W)	Observe demonstration of system performance for acceptance
<b>R</b> eceipt <b>A</b> cknowledge	(RA)	Confirm receipt of submittal with no review necessary
<b>S</b> urveillance Review	(S)	A quality assurance review based on risk, complexity, and workload
Performance <b>V</b> erification and Acceptance Testing	(V)	A demonstration of satisfactory construction and system performance
Receive <b>C</b> opy of Correspondence	(C)	Receive a copy of the transmittal sheet and/or correspondence letter
<b>Q</b> uality <b>A</b> ssurance Inspection	(QA)	Witnessing satisfactory performance without testing all devices or visual inspection of various parts of the system

SECTION 01 50 00.05 20

TEMPORARY FACILITIES AND CONTROLS FOR DESIGN-BUILD  
05/13

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511 (2007) Standard for Reduced-Pressure  
Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH  
(FCCCHR)

FCCCHR List (continuously updated) List of Approved  
Backflow Prevention Assemblies

FCCCHR Manual (1988e9) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241 (2013) Standard for Safeguarding  
Construction, Alteration, and Demolition  
Operations

NFPA 70 (2011; Errata 2 2012) National Electrical  
Code

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD (2009) Manual of Uniform Traffic Control  
Devices

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247 Comprehensive Procurement Guideline for  
Products Containing Recovered Materials

1.2 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Traffic control plan; G

SD-06 Test Reports

Backflow Preventer Tests; G

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.3 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. These non-construction products contain the highest practicable percentage of recycled or recovered materials and can be recycled when no longer needed.

1.4 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.4.1 Backflow Prevention Training Certificate

The Contractor shall submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.5 TEMPORARY UTILITIES

1.5.1 Contractor Utilities

The Contractor shall provide his own utilities.

1.5.2 Utilities at Special Locations

Reasonable amounts of utilities will be made available to the Contractor at the prevailing Government rates. These rates may be obtained upon application to the Commanding Officer. The Contractor will be responsible for making connections, providing transformers and meters, and making disconnections; and for providing backflow preventer devices on connections to domestic water lines.

1.5.3 Location of Underground Utilities

See specification section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS paragraph "Location of Underground Utilities".

1.6 BACKFLOW TESTER CERTIFICATION

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the

regulatory agency. Tester shall not be affiliated with any company participating in any other phase of this Contract.

#### 1.7 WEATHER PROTECTION

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday.

##### 1.7.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions shall include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

##### 1.7.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

- a. Condition FOUR (Sustained winds of 58 mph or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers all scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards. Review requirements pertaining to "Condition THREE" and continue action as necessary to attain "Condition FOUR" readiness. Contact Contracting Officer for Condition of Readiness (COR) updates and completion of required actions.
- b. Condition THREE (Sustained winds of 58 mph or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition TWO" readiness. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Reinforce or remove formwork and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and COR updates and completion of required actions.
- c. Condition TWO (Sustained winds of 58 mph or greater expected within 24 hours): Secure the jobsite, and leave Government premises.
- d. Condition ONE (Sustained winds of 58 mph or greater expected within 12 hours): Contractor access to the jobsite and Government premises is prohibited.

## 1.8 STATION OPERATION AFFECT ON CONTRACTOR OPERATIONS

### 1.8.1 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a [Traffic Control Plan](#) detailing the proposed controls to traffic movement for approval. The plan shall be in accordance with State and local regulations and the [MUTCD](#), Part VI. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

## 1.9 STORAGE AREAS

The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

### 1.9.1 Storage in Existing Buildings

The Contractor shall be working in [and](#) around existing buildings; the storage of material will not be allowed in the buildings. Provide [8 foot](#) high security fence with a lockable gate around the storage area. Remove at the completion of work.

## 1.10 TEMPORARY SANITARY FACILITIES

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage through connection to a municipal, district, or station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units, and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Include provisions for pest control and elimination of odors.

[Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. The contractor MUST dump off base or the contractor MUST dump at 590 lift station after checking in with 440. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.](#)



#### 1.11 TEMPORARY BUILDINGS

Temporary facilities (including trailers) shall be in like new condition and shall be maintained throughout the project. Locate these facilities where directed and within the indicated operations area. Failure to maintain storage trailers or buildings to these standards shall result in the removal of non-complying units at the Contractor's expense. A sign not smaller than 24 by 24 inches shall be conspicuously placed on the trailer depicting the company name, business phone number, and emergency phone number. Trailers shall be anchored to resist high winds and must meet applicable state or local standards for anchoring mobile trailers.

##### 1.11.1 Maintenance of Temporary Facilities

Suitably paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

Upon completion of the project remove the bulletinboard, signs, barricades, haulroads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. All temporary water and sewer lines must be capped off at the main and piping removed after all temporary trailers are moved. Restore to the original or better condition, areas used by the Contractor for the storage of equipment or material, or other use. Gravel used to traverse grassed areas must be removed and the area restored to its original condition, including top soil and seeding as necessary.

##### 1.11.2 Quality Control Manager Records and Field Office

Provide on the jobsite an office with approximately 200 square feet of useful floor area for the exclusive use of the QC Manager. Provide a weathertight structure with adequate heating and cooling, toilet facilities, lighting, ventilation, a 4 by 8 foot plan table, a standard size office desk and chair, computer station, and working communications facilities. Provide either a 1,500 watt radiant heater and a window-mounted air conditioner rated at 9,000 Btus minimum or a window-mounted heat pump of the same minimum heating and cooling ratings. Provide a door with a cylinder lock and windows with locking hardware. Make utility connections. Locate where indicated. File quality control records in the office and make available at all times to the Government. After completion of the work, remove the entire structure from the site.

#### PART 2 PRODUCTS

##### 2.1 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with bronze gate valve and strainer. The particular make, model/design, and size of backflow preventers to be installed shall be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and shall be accompanied by a Certificate of Full Approval from FCCCHR List.

##### 2.2 PROJECT SIGN

Prior to initiating any work on site, provide one project identification sign at the location coordinated with the Contracting Officer. Construct the sign in accordance with project sign detail attached at the end of

this section. Maintain sign throughout the life of the project. Upon completion of the project, remove the sign from the site. Provide color rendering of the project at a minimum size of 27" high x 36" wide. Reproduce the rendering on the signboard or enclose a copy of the rendering under a water-proof, transparent cover, and caulk for weather protection.

#### 2.2.1 Project Identification Signboard (Navy)

A project identification signboard shall be provided in accordance with attached Plates. The signboard shall be provided at a conspicuous location on the job site where directed by the Contracting Officer.

- a. The field of the sign shall consist of a minimum of 4 by 8 foot sheet of exterior plywood.
- b. The entire signboard and supports shall be painted. The lettering and sign work shall be performed by a skilled sign painter using paint known in the trade as bulletin colors. The colors, lettering sizes, and lettering styles shall be as indicated.
- c. NAVFAC logo shall be a sticker/decal with either transparent or white background or paint the logo by stencil onto the sign. The weather resistant sticker/decal film shall be rated for a minimum of 2-year exterior vertical exposure. NAVFAC Logo is available at:  
[https://portal.navfac.navy.mil/portal/page?\\_pageid=181,3465071&\\_dad=portal&\\_schema=PORTAL](https://portal.navfac.navy.mil/portal/page?_pageid=181,3465071&_dad=portal&_schema=PORTAL)
- d. Sign paint colors
  1. Blue = To match dark blue color in the NAVFAC logo.
  2. White = To match Brilliant White color in the NAVFAC logo.
- e. Final signboard artwork (rendering) may be either mounted under plexiglas as indicated in attached Plates, or at the Contractor's option may be electrostatically printed on self-adhering, weather resistant, glossy vinyl film and mounted to signboard. Provide film that is capable of full color reproduction of the building rendering and is rated for a minimum of 2 years exterior vertical exposure.

### PART 3 EXECUTION

#### 3.1 TEMPORARY PHYSICAL CONTROLS

##### 3.1.1 Access Controls

###### 3.1.1.1 Temporary Barricades

Contractor shall provide for barricading around all work areas to prevent public access.

###### 3.1.1.2 Fencing

- a. Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

- b. In addition, prior to the start of work, enclose the construction site with a temporary safety fence. The safety fence shall be bright orange, shall be made of high density polyethylene grid or approved equal or plastic fence from recovered materials containing 60-100 percent recovered content level plastic, a minimum of 42 inches high, supported and tightly secured to steel posts located on minimum 10 foot centers. Remove the fence from the work site upon completion of the contract.

#### 3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 300 feet. All points of entry shall have signs designating the construction site as a hard hat area.

#### 3.1.1.4 Traffic Work

All work around/involving roadways, to include roadway excavations and utility crossings, will be conducted in accordance with Manual of Traffic Control Devices. Contractors shall provide and ensure appropriate road closure and detour signs are established as necessary for motor traffic management. All road closures shall be coordinated with the Contracting Officer in advance. Self-illuminated (lighted) barricades shall be provided during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Road closures shall require a road closure plan showing the location of signage.

### 3.2 TEMPORARY WIRING

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Assured Equipment Grounding Conductor Program. Program shall include frequent inspection of all equipment and apparatus.

### 3.3 REDUCED PRESSURE BACKFLOW PREVENTERS

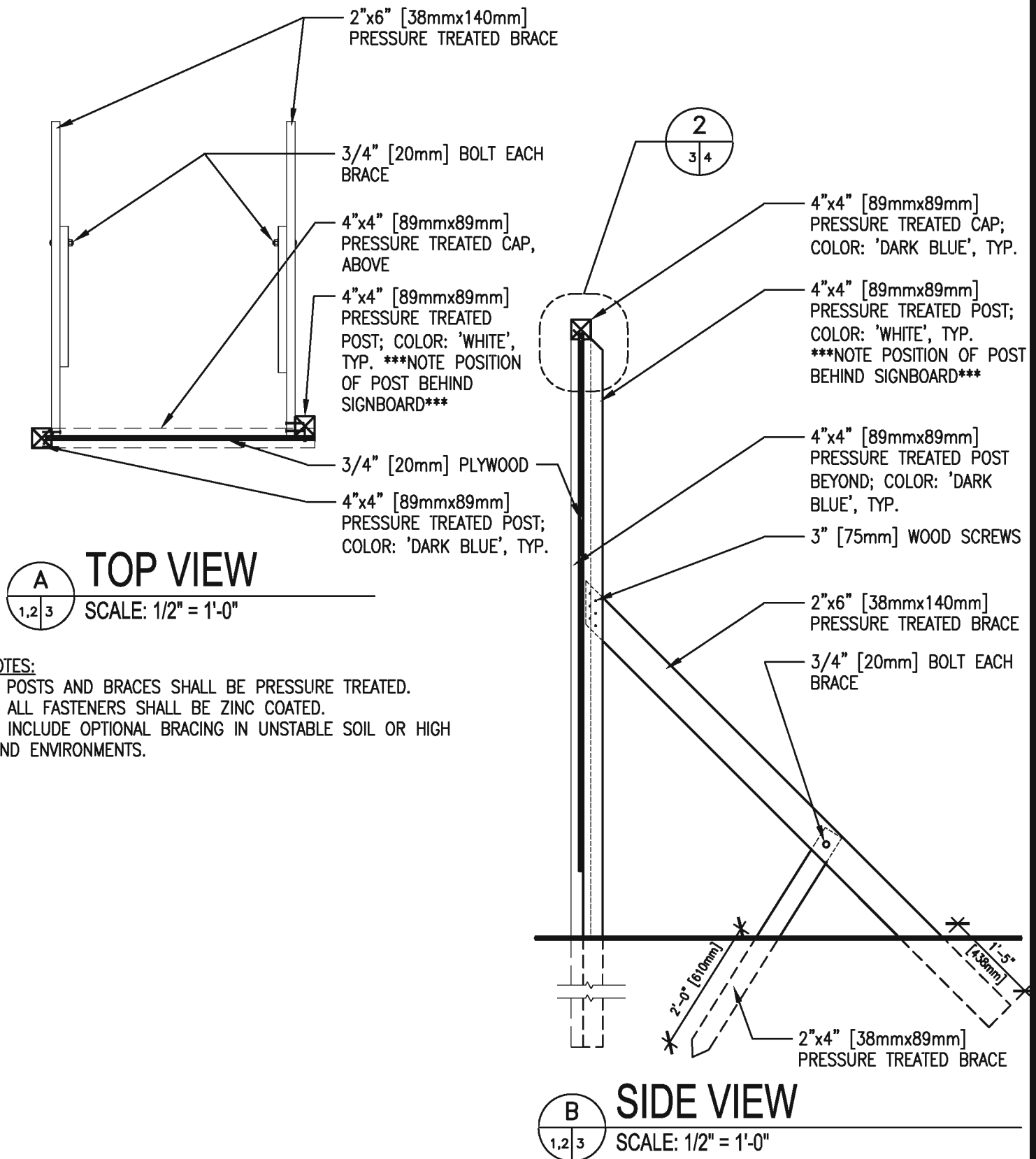
Provide an approved reduced pressure backflow prevention assembly at each location where the Contractor taps into the Government potable water supply.

A certified tester(s) shall perform testing of backflow preventer(s) for proper installation and operation and provide subsequent tagging. Backflow preventer tests shall be performed using test equipment, procedures, and certification forms conforming to those outlined in the latest edition of the Manual of Cross-Connection Control published by the FCCCHR Manual. Test and tag each reduced pressure backflow preventer upon initial installation (prior to continued water use) and quarterly thereafter. Tag shall contain the following information: make, model, serial number, dates of tests, results, maintenance performed, and signature of tester. Record test results on certification forms conforming to requirements cited earlier in this paragraph.

-- End of Section --

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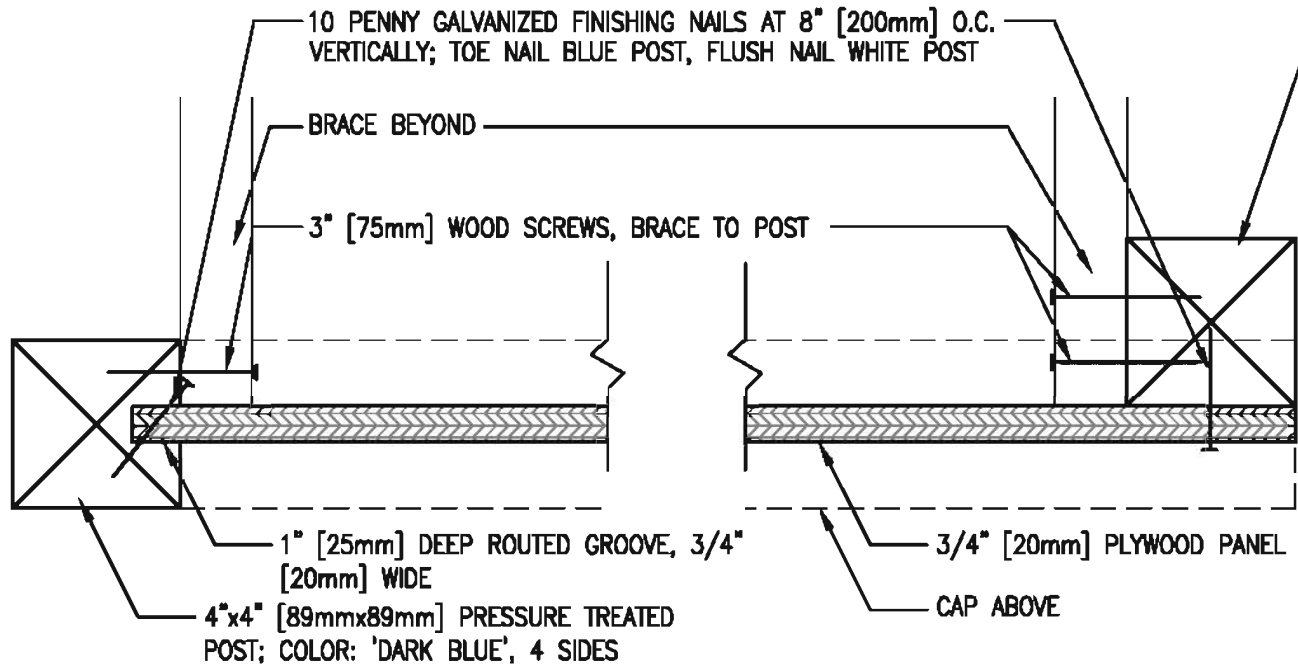




# PROJECT IDENTIFICATION SIGNBOARD SUPPORT DETAILS

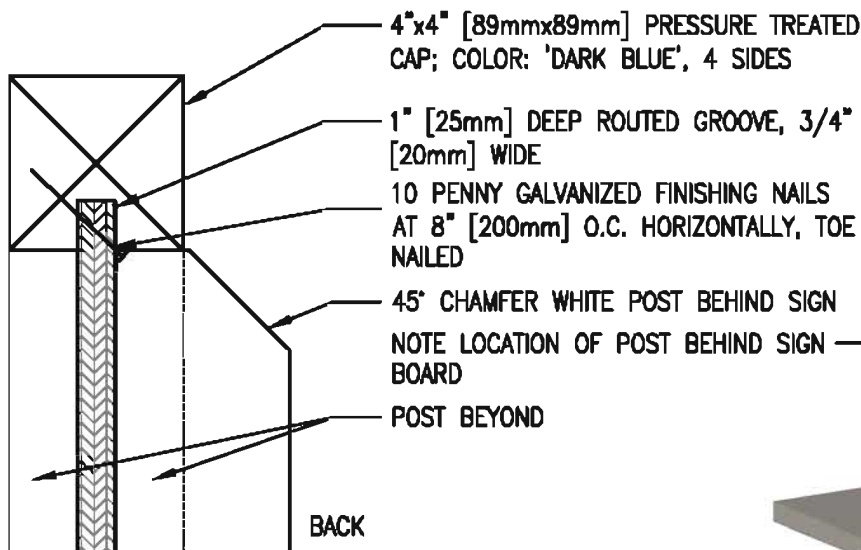
PLATE 3

4"x4" [89mmx89mm] PRESSURE TREATED POST; COLOR: 'WHITE',  
TYP. \*\*\*NOTE POSITION OF POST BEHIND SIGNBOARD\*\*\*



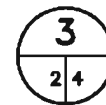
## PLAN SECTION

SCALE: 3" = 1'-0"



## SECTION AT TOP

SCALE: 3" = 1'-0"

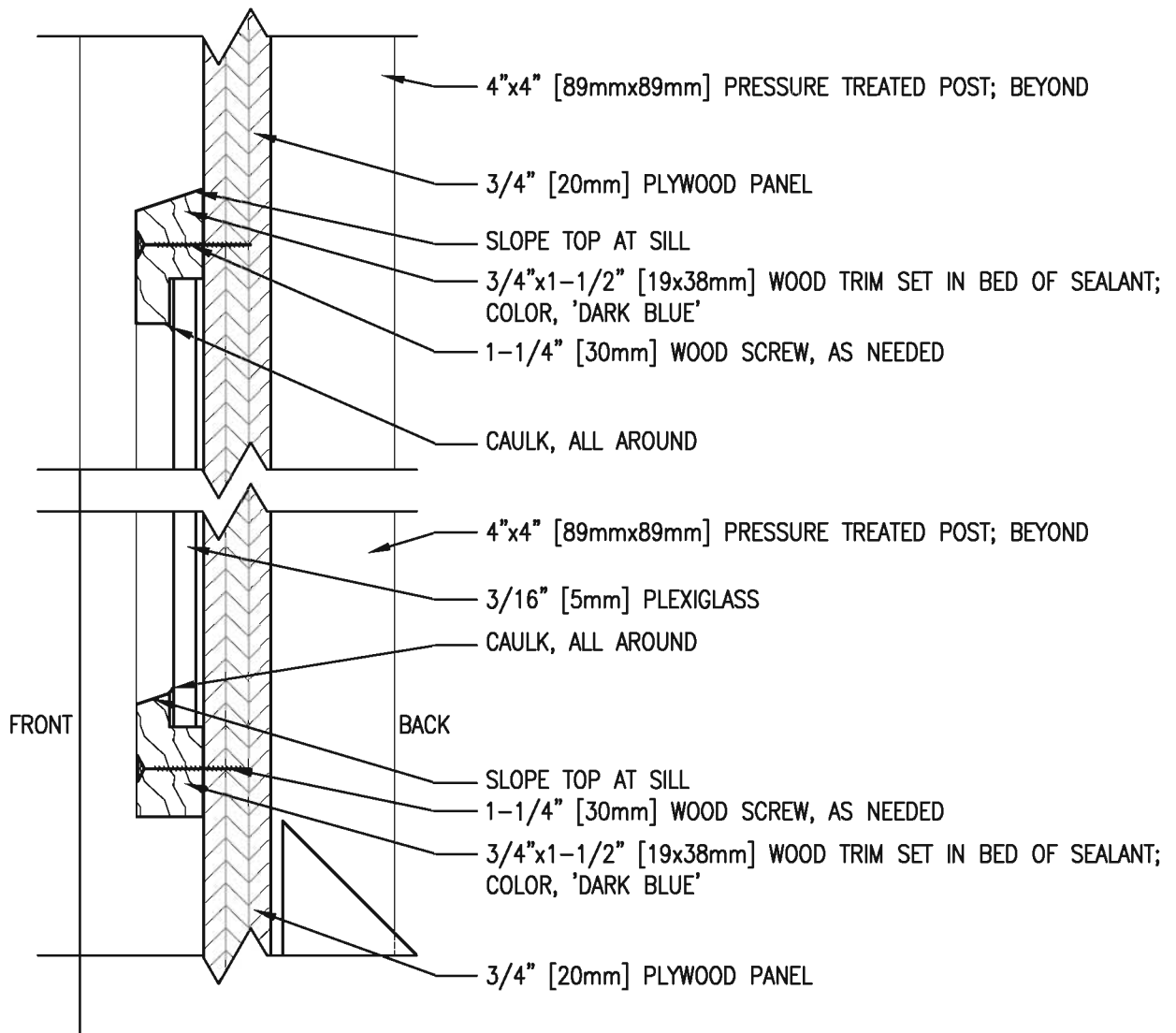


## ISO VIEW

SCALE: NONE

# PROJECT IDENTIFICATION SIGNBOARD SECTIONS

PLATE 4



## SECTION AT RENDERING FRAME

SCALE: 6" = 1'-0"

# PROJECT IDENTIFICATION SIGNBOARD SECTION

PLATE 5



SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

11/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004 (1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)

EPA 833-R-060-04 (2007) Developing Your Storm Water Pollution Prevention Plan, a Guide for Construction Sites

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

40 CFR 112 Oil Pollution Prevention

40 CFR 241 Guidelines for Disposal of Solid Waste

40 CFR 243 Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste

40 CFR 258 Subtitle D Landfill Requirements

40 CFR 260 Hazardous Waste Management System: General

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 266 Standards for the Management of Specific

	Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
40 CFR 51	Requirements For Preparation, Adoption, And Submittal Of Implementation Plans
40 CFR 52	Approval And Promulgation Of Implementation Plans
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for

Shipments and Packagings

49 CFR 178

Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

- a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.
- b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.
- c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.
- d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.
- f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.
- g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.

- h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

#### 1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

#### 1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

#### 1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

#### 1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

#### 1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

- a. Is regulated as a hazardous material per 49 CFR 173, or
- b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or
- c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition,

weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

#### 1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

#### 1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

- a. It is not prohibited in other State regulations or local ordinances
- b. The amount generated is "de minimus" (a small amount)
- c. It is the result of minor leaks or spills resulting from normal process operations
- d. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

#### 1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

#### 1.2.11 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)  
chlorofluorocarbon-12 (CFC-12)  
chlorofluorocarbon-13 (CFC-13)  
chlorofluorocarbon-111 (CFC-111)

chlorofluorocarbon-112 (CFC-112)  
chlorofluorocarbon-113 (CFC-113)  
chlorofluorocarbon-114 (CFC-114)  
chlorofluorocarbon-115 (CFC-115)  
chlorofluorocarbon-211 (CFC-211)  
chlorofluorocarbon-212 (CFC-212)  
chlorofluorocarbon-213 (CFC-213)  
chlorofluorocarbon-214 (CFC-214)  
chlorofluorocarbon-215 (CFC-215)  
chlorofluorocarbon-216 (CFC-216)  
chlorofluorocarbon-217 (CFC-217)  
chlorofluorocarbon-500 (CFC-500)  
chlorofluorocarbon-502 (CFC-502)  
chlorofluorocarbon-503 (CFC-503)  
halon-1211  
halon-1301  
halon-2402  
carbon tetrachloride  
methyl bromide  
methyl chloroform

#### 1.2.11.1 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (e.g., thermostats) and lamps (e.g., fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at [40 CFR 273](#).

#### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval](#). The following shall be submitted in accordance with [Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES](#) and [Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES](#):

##### SD-01 Preconstruction Submittals

Preconstruction Survey; G

Solid Waste Management Plan and Permit; G

Regulatory Notifications; G

Environmental Management Plan; G

Storm Water Pollution Prevention Plan; G

Air Emissions Source Specification Data; G

Dirt and Dust Control Plan

Contractor Hazardous Material Inventory Log; G

##### SD-06 Test Reports

Laboratory Analysis

Disposal Requirements

Erosion and Sediment Control Inspection Reports

Storm Water Inspection Reports for General Permit

Contractor 40 CFR employee training records

Solid Waste Management Report; G

#### SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Storm Water Pollution Prevention Plan compliance notebook; G

Waste Determination Documentation

Disposal Documentation for Hazardous and Regulated Waste

Contractor 40 CFR Employee Training Records

Solid Waste Management Permit

Solid Waste Management Report

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management

Regulatory Notifications

#### 1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work shall be done by qualified laboratories; and where required by law, the laboratories shall be certified.

#### 1.4.1 Environmental Compliance Assessment Training and Tracking System (ECATTS)

The QC Manager is responsible for environmental compliance on projects unless an Environmental Manager is named. The QC Manager (and alternative QC Manager) or Environmental Manager shall complete ECATTS training prior to starting respective portions of on-site work under this contract. If personnel changes occur for any of these positions after starting work, replacement personnel shall complete ECATTS training within 14 days of assignment to the project.

Submit an ECATTS certificate of completion for personnel who have completed the required "Environmental Compliance Assessment Training and Tracking System (ECATTS)" training. This training is web-based and can be accessed from any computer with Internet access using the following instructions.

Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to <http://navfac.ecatts.com/>. Use password "navfac" (in all lower case letters) to gain access to the training site.

This training has been structured to allow contractor personnel to receive credit under this contract and also to carry forward credit to future contracts. Contractors shall ensure that the QC Manager (and alternate QC Manager) or Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific State regulatory requirements; therefore, Contractors working in multiple states will be required to re-take modules tailored to the state where the contract work is being performed.

ECATTS is available for use by all contractor and subcontractor personnel associated with this project. These other personnel are encouraged (but not required) to take the training and may do so at their discretion.

#### 1.4.2 Conformance with the Environmental Management System

The Contractor shall perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). The Contractor shall perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. The Contractor will provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, the Contractor shall take corrective and/or preventative actions. In addition, the Contractor shall ensure that its employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

The Contractor is responsible for ensuring that their employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact shall be competent on the basis of appropriate education, training or experience. Upon contract award, the Contracting Officer's Representative will notify the installation's EMS coordinator to arrange EMS training. Refer to Section 01 57 19.01 20,



SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for additional site specific EMS requirements related to construction. The installation's EMS coordinator shall identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. The Contractor shall provide training documentation to the Contracting Officer. The EMS coordinator shall retain associated records.

## 1.5 QUALITY ASSURANCE

### 1.5.1 Preconstruction Survey

Perform a [Preconstruction Survey](#) of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

### 1.5.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater permitting), the Contractor must coordinate with the Contracting Officer. The Contractor shall submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

### 1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and activity environmental staff to discuss the proposed Environmental Management Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

### 1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager will be directly responsible for coordinating contractor compliance with Federal, State, local, and [station requirements](#). The Environmental Manager will ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Management Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite

Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

#### 1.5.5 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the contract meeting applicable 40 CFR requirements. The Contractor will ensure every employee completes a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures compliance with Federal, State and local regulatory requirements for RCRA Large Quantity Generator. The Contractor will provide a Position Description for each employee, by subcontractor, based on the Davis-Bacon Wage Rate designation or other equivalent method, evaluating the employee's association with hazardous and regulated wastes. This Position Description will include training requirements as defined in 40 CFR 265 for a Large Quantity Generator facility. Submit these training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

## PART 2 PRODUCTS

Not Used.

## PART 3 EXECUTION

### 3.1 ENVIRONMENTAL MANAGEMENT PLAN

Prior to initiating any work on site, the Contractor will meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Contractor's Environmental Plan shall incorporate construction related objectives and targets from the installation's Environmental Management System. The Environmental Management Plan will be submitted in the following format and shall include the elements specified below.

#### a. Description of the Environmental Management Plan

##### (1) General overview and purpose

- (a) A brief description of each specific plan required by environmental permit or elsewhere in this contract.
- (b) The duties and level of authority assigned to the person(s) on the job site that oversee environmental compliance.
- (c) A copy of any standard or project specific operating procedures that will be used to effectively manage and protect the environment on the project site.
- (d) Communication and training procedures that will be used to convey environmental management requirements to contractor employees and subcontractors.

(e) Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

(2) General site information

(3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

b. Management of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

(5) Stream crossings

(6) Fish and wildlife resources

(7) Wetland areas

c. Protection of Historical and Archaeological Resources

(1) Objectives

(2) Methods

d. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

(4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).

e. Protection of the Environment from Waste Derived from Contractor Operations

(1) Control and disposal of solid and sanitary waste. If Section 01 74 19.05 20 is included in the contract, submit the plan required by that section as part of the Environmental Management Plan.

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

- (a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;
- (b) Sampling/analysis plan;
- (c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);
- (d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);
- (e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);
- (f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;
- (g) Used oil management procedures in accordance with 40 CFR 279;
- (h) Pollution prevention\hazardous waste minimization procedures;
- (i) Plans for the disposal of hazardous waste by permitted facilities;
- (j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

- (1) Procedures to prevent releases to the environment
- (2) Notifications in the event of a release to the environment

g. Regulatory Notification and Permits

- (1) List what notifications and permit applications must be made. Demonstrate that those permits have been obtained by including copies of all applicable, environmental permits.

3.1.1 Environmental Protection Plan Review

Within thirty days after the Contract award date, submit the proposed Environmental Management Plan for further discussion, review, and approval. Commencement of work will not begin until the environmental management plan has been approved.

3.1.2 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities"

FAR Clause 52.236-7.

Only an air emissions permit will be obtained by the Contracting Officer.

Where required by the State regulatory authority, the inspections and certifications will be provided through the services of a Professional Engineer (PE), registered in the State where the work is being performed. As a part of the quality control plan, which is required to be submitted for approval by the quality control section, provide a sub item containing the name, appropriate professional registration or licence number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

### 3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

#### 3.2.1 Erosion and Sediment Control Measures

##### 3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

##### 3.2.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon

completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

#### 3.2.1.3 Temporary Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. The Contractor is responsible for fully executing the plans and procedures approved in the Contractor's Erosion Control plan. Provide temporary protection of disturbed soils in accordance with North Carolina Sediment Control Commission (NCSCC), Erosion and Sediment Control Planning and Design Manual.

#### 3.2.2 Erosion and Sediment Control Inspection Reports

Submit "Erosion and Sediment Control Inspection Reports" (E&S) (form provided at the pre-construction conference) and Storm Water Inspection Reports for General Permit NCG010000 - Land Disturbing Activities (form provided at [http://h20.enr.state.nc.us/su/PDF\\_Files/SW\\_General\\_Permits/NCG01\\_Inspect\\_log.pdf](http://h20.enr.state.nc.us/su/PDF_Files/SW_General_Permits/NCG01_Inspect_log.pdf)) to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

Note erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports if applicable.

##### 3.2.2.1 Storm Water Pollution Prevention Plan

In conjunction with the Contracting Officer, the Contractor shall apply for and obtain coverage under the North Carolina General Pollution Discharge and Elimination System General Permit for discharges of stormwater from Construction Activities, when 10,000 square feet or more, of land area is disturbed by construction or related construction support operations, including clearing, grubbing, grading, excavation, soil or gravel lay down areas, and demolition that exposes soil.

In North Carolina, the NPDES General Permit is issued with the Erosion and Sediment Control Permit; no separate application is necessary. Coverage under this permit requires the D-B Contractor to prepare a financial responsibility/ownership form and forward to MCB Camp Lejeune for concurrence prior to submittal. In addition, the Contractor shall provide the permit fee to the North Carolina Department of Environmental and Natural Resources (NCDENR) before any land disturbing activities begin. The Contractor shall file for permit coverage on behalf of the Contracting Officer and himself and file a Notice of Termination once construction is complete and the site is stabilized with a final sustainable cover.

Under the terms and conditions of the permit, the Contractor may be required to install, inspect, maintain best management practices (BMPs), and submit stormwater BMP inspection reports and stormwater pollution prevention plan inspection reports. The Contractor shall ensure construction operations and management are constantly in compliance with the terms and conditions of the general permit for storm water discharges from construction activities.

a. The SWPPP shall:

- (1) Identify potential sources of pollution which may be reasonably

expected to affect the quality of storm water discharge from the site.

- (2) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.
- (3) Ensure compliance with terms of the EPA or State general permit for storm water discharge.
- (4) Select applicable best management practices from EPA 833-R-060-04.
- (5) Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.

#### 3.2.2.2 Storm Water Pollution Prevention Plan Compliance Notebook

The contractor shall create and maintain a three ring binder of documents that demonstrate compliance with the Stormwater Construction Activity permit. The binder shall include a copy of the permit Registration Statement, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports, copies of correspondence with the North Carolina Department of Environmental and Natural Resources (NCDENR) and a copy of the permit Notice of Termination. At the completion of the project the folder shall become the property of the Government. The compliance notebook shall be provided to Contracting Officer. An advance copy of the Registration Statement shall be provided to the Contracting Officer immediately after the form is presented to the permitting agency.

#### 3.2.3 Stormwater Drainage and Construction Dewatering

There will be no discharge of excavation ground water to the sanitary sewer, storm drains, or to the river without prior specific authorization of the Environmental Division in writing. Discharge of hazardous substances will not be permitted under any circumstances.

Construction site runoff will be prevented from entering any storm drain or the river directly by the use of method suitable to the Environmental Division. Contractor will provide erosion protection of the surrounding soils.

Construction Dewatering shall not be discharged to the sanitary sewer. If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Authorization for any contaminated groundwater release shall be obtained in advance from the base Environmental Officer. Discharge of hazardous substances will not be permitted under any circumstances.

#### 3.2.4 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands except as authorized herein. The protection of wetlands is the Contractor's responsibility. Authorization to enter specific wetlands identified will not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries. Contractor shall ensure wetland boundaries are clearly marked prior to any clearing and grubbing operations. The wetland delineation will be conducted on site by the design engineer with

assistance as needed from the Army Corps of Engineers and the base Environmental Management Division.

### 3.2.5 Air Emissions Permit Application - Government Prepared

This contract may include the design and/or construction of regulated air emission sources that require an air quality permit for construction and operation in accordance with North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality (NCDAQ) permitting procedures. The government will prepare a permit application package for all applicable emission sources in the contract, however the contractor is required to coordinate submission of all [Air Emissions Source Specification Data](#) necessary for the preparation of the application package a minimum of 180 calendar days prior to any construction or installation of any emission source point associated with this project. Marine Corps Base, Camp Lejeune and Marine Corps Air Station, New River, have been issued one Clean Air Act Title V Construction and Operation Permit issued by NCDAQ. The facility is considered a major source for both criteria pollutants and federally listed Hazardous Air Pollutant (HAP). The facility is also subject to North Carolina Toxic Air Pollutant (TAP) regulations to include requirements for facility wide air dispersion modeling and facility fence line emission limits for certain pollutants. Typical emission sources requiring a permit include:

#### a. Boilers

- (1) Boilers less than 10 MMBtu/hr are considered insignificant per NC regulations (15A NCAC 2Q.0503), but may still require analysis & permitting.

#### b. Storage Tanks

#### c. Fuel Dispensing

#### d. Emergency Generators

#### e. Non-Emergency Generators

#### f. Engine Testing Stations or Stands (where engine is removed from mobile vehicle/craft for testing)

#### g. Fire Training Pits

#### h. Woodworking/Grinding

#### i. Abrasive Blasting

#### j. Paint Stripping

#### k. Parts Cleaners/Ovens

#### l. Surface Coating (Paint Booths)

#### m. Epoxy Curing Benches

#### n. Remediation Systems

#### o. Welding/Soldering



p. Refrigerant Recovery/Recycling

3.2.5.1 Regulations Applicability

The permit application will require an evaluation of the applicability of the following regulations:

- a. New Source Review (NSR) / Prevention of Significant Deterioration (PSD) (40 CFR 51, 40 CFR 52)
- b. New Source Performance Standards (NSPS) (40 CFR 60)
  - (1) Possible source categories include but are not limited to boilers & internal combustion engines/generators
- c. National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR 61, 40 CFR 63)
  - (1) Possible source categories include but are not limited to Reciprocating Internal Combustion Engines (RICE)
- d. North Carolina Air Toxics Program (15A NCAC 2D.1100, 2Q.0700)
  - (1) Many new air emission sources may require air dispersion modeling to receive a permit and/or demonstrate compliance. A July 2010 rule change in the North Carolina regulatory process removed the exemption of combustion sources (e.g. boilers, generators) from the air toxics program effective for sources permitted requiring modeling for these types of sources. This imposes additional permitting requirements on the facility. Projects including combustion sources should be coordinated on a case-by-case basis with the NAVFAC IPT and the installation Environmental Management Division.

3.2.5.2 Type Of Permit Required

Based on preliminary review, it is not anticipated that new emission sources will require New Source Review (NSR) permitting; however, potential air emission rates for new emission sources may exceed Prevention of Significant Deterioration (PSD) thresholds, therefore PSD avoidance permit conditions and/or operating limits (e.g. fuel usage or operating hour limits).

3.2.5.3 Permit Application Package

The permit application package will include the following:

- a. Clear, concise, & explanatory supporting documentation & narrative
- b. Required permit application forms (Title V)
- c. Air emissions calculations
- d. Equipment drawings and specifications
- e. Facility diagrams and/or maps

#### 3.2.5.4 Time Allowance For Permit

The contractor should allow for approximately six months from the time of permit application submission to permit issuance. Construction of an air emission source cannot begin without a permit or a waiver, and operation of the source cannot begin without a permit.

### 3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the Contracting Officer. Stop work in the immediate area of the discovery until directed by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

### 3.4 SOLID WASTE MANAGEMENT PLAN and PERMIT

Provide to the contracting officer written notification of the quantity of solid waste/debris that is anticipated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance or as applicable, submit one copy of a State and local [Solid Waste Management Permit](#) or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

#### 3.4.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

The Contractor will include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor will submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

#### 3.4.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including [40 CFR 241](#), [40 CFR 243](#), and [40 CFR 258](#).

Manage spent hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

### 3.5 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

### 3.6 CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG

Submit the "Contractor Hazardous Material Inventory Log" (found at: <http://www.wbdg.org/ccb/NAVGRAPH/graphdoc.pdf>), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

#### 3.6.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Resource Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions the Contractor must coordinate with the Activity environmental office. Refer to **Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS** for the Activity Point of Contact information.

### 3.7 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Management Plan. Consult with the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

### 3.8 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

### 3.9 HAZARDOUS MATERIAL MANAGEMENT

No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract.

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a MSDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

### 3.10 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

#### 3.10.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage

areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

### 3.10.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the Contractor shall immediately notify the Contracting Officer. The Contractor shall not disturb this material until authorized by the Contracting Officer.

### 3.11 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices shall comply with 40 CFR 112. Secondary containment shall be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm shall be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drip pans are required and the tanks must be covered during inclement weather.

### 3.12 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable State and local regulations. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor will reimburse the Government for such assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the government for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the government for all costs incurred including sample analysis materials,

equipment, and labor if the government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

- a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or
- b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

### 3.13 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

#### 3.13.1 Facility Hazardous Waste Generator Status

MCB Camp Lejeune is designated as a Large Quantity Generator. All work conducted within the boundaries of this activity must meet the regulatory requirements of this generator designation. The Contractor will comply with all provisions of Federal, State and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of all construction derived wastes.

#### 3.13.2 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government.

Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste will be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

##### 3.13.2.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

<u>Contract Number</u>	_____	<u>Contractor</u>	_____
<u>Haz/Waste or</u>			
<u>Regulated Waste POC</u>	_____	<u>Phone Number</u>	_____

Type of Waste \_\_\_\_\_ Source of Waste \_\_\_\_\_  
Emergency POC \_\_\_\_\_ Phone Number \_\_\_\_\_  
Location of the Site: \_\_\_\_\_  
(Attach Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request. The designated area where waste is being stored shall be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

### 3.13.2.2 Sampling and Analysis of HW

#### a. Waste Sampling

Sample waste in accordance with EPA 530/F-93/004. Each sampled drum or container will be clearly marked with the Contractor's identification number and cross referenced to the chemical analysis performed.

#### b. Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. The Contractor will provide all analytical results and reports performed to the Contracting Officer.

#### c. Analysis Type

Identify waste hazardous material/hazardous waste by analyzing for the following properties as a minimum: ignitability, corrosiveness, total chlorides, BTU value, PCBs, TCLP for heavy metals, and cyanide.

### 3.13.2.3 Asbestos Certification

Items, components, or materials disturbed by or included in work under this contract may involve asbestos. Other materials in the general area around where work will be performed may contain asbestos. All thermal insulation, in all work areas, should be considered to be asbestos unless positively identified by conspicuous tags or previous laboratory analysis certifying them as asbestos free.

Inadvertent discovery of non-disclosed asbestos that will result in an abatement action requires a change in scope before proceeding. Upon discovery of asbestos containing material not identified in the contract documents, the Contractor shall immediately stop all work that would generate further damage to the material, evacuate the asbestos exposed area, and notify the Contracting Officer for resolution of the situation prior to resuming normal work activities in the affected area. The Contractor will not remove or perform work on any asbestos containing materials without the prior approval of the Contracting Officer. The Contractor will not engage in any activity, which would remove or damage such materials or cause the generation of fibers from such materials.

Asbestos containing waste shall be managed and disposed of in accordance with applicable environmental law. Asbestos containing waste shall be manifested and the manifest provided to the Contracting Officer.

#### 3.13.2.4 Hazardous Waste Disposal

No hazardous, toxic, or universal waste shall be disposed or hazardous material abandoned on government property. And unless otherwise otherwise noted in this contract, the government is not responsible for disposal of Contractor generated waste material. The disposal of incidental materials used to accomplish the work including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive.

The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or water way or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

Control of stored waste, packaging, sampling, analysis, and disposal will be determined by the details in the contract. The requirements for jobs in the following paragraphs will be used as the guidelines for disposal of any hazardous waste generated.

##### a. Responsibilities for Contractor's Disposal

Contractor responsibilities include any generation of WHM/HW requiring Contractor disposal of solid waste or liquid.

- (1) The Contractor agrees to provide all service necessary for the final treatment/disposal of the hazardous material/waste in accordance with all local, State and Federal laws and regulations, and the terms and conditions of the contract within sixty (60) days after the materials have been generated. These services will include all necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal, and/or transportation, including manifesting or completing waste profile sheets, equipment, and the compilation of all documentation is required).
- (2) Contain all waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 272, 40 CFR 273, 40 CFR 279, 40 CFR 280, and 40 CFR 761.
- (3) Obtaining a representative sample of the material generated for each job done to provide waste stream determination.
- (4) Analyzing for each sample taken and providing analytical results to the Contracting Officer. Provide two copies of the results.
- (5) Determine the DOT proper shipping names for all waste (each container requiring disposal) and will demonstrate how this determination is developed and supported by the sampling and analysis requirements contained herein to the Contracting Officer.

##### Contractor Disposal Turn-In Requirements

For any waste hazardous materials or hazardous waste generated which requires the Contractor to dispose of, the following conditions must be complied with in order to be acceptable for disposal:

- a. Drums compatible with waste contents and drums meet DOT requirements



for 49 CFR 173 for transportation of materials.

- b. Drums banded to wooden pallets. No more than three (3) 55 gallon drums to a pallet, or two (2) 85 gallon over packs.
- c. Band using 1-1/4 inch minimum band on upper third of drum.
- d. Recovery materials label (provided by Code 106.321) located in middle of drum, filled out to indicate actual volume of material, name of material manufacturer, other vendor information as available.
- e. Always have three (3) to five (5) inches of empty space above volume of material. This space is called 'outage'.

### 3.13.3 Class I ODS Prohibition

Class I ODS as defined and identified herein will not be used in the performance of this contract, nor be provided as part of the equipment. This prohibition will be considered to prevail over any other provision, specification, drawing, or referenced documents. Regulations related to the protection of stratosphere ozone may be found in 40 CFR 82.

Heating and air conditioning technicians must be certified through an EPA-approved program. Copies of certifications shall be maintained at the employees' place of business and be carried as a wallet card by the technician, as provided by environmental law. Accidental venting of a refrigerant is a release and shall be reported to the Contracting Officer.

#### 3.13.3.1 Universal Waste/e-Waste Management

Universal waste including but not limited to some mercury containing building products such florescent lamps, mercury vapor lamps, high pressure sodium lamps, CRTs, batteries, aerosol paint containers, electrical equipment containing PCBs, and consumed electronic devices, shall be managed in accordance with applicable environmental law and installation instructions.

### 3.14 DUST CONTROL

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

#### 3.14.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

### 3.15 ABRASIVE BLASTING

#### 3.15.1 Blasting Operations

The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive, agent, paint chips, and other debris .

#### 3.15.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per paragraph entitled Laboratory Analysis of this section. Hazardous waste generated from blasting operations will be managed in accordance with paragraph entitled "Hazardous Waste\Debris Management" of this section and with the approved HWMP. Disposal of non-hazardous abrasive blasting debris will be in accordance with paragraph entitled, "Control and Disposal of Solid Wastes".

### 3.16 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

### 3.17 MERCURY MATERIALS

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed. Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Cleanup of a mercury spill shall not be recycled and shall be managed as a hazardous waste for disposal.

-- End of Section --

SECTION 01 57 19.01 20

SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS

11/14

PART 1 GENERAL

1.1 REGIONAL REQUIREMENTS

1.1.1 Mid-Atlantic

1.1.1.1 North Carolina

a. MCB Camp Lejeune

(1) Removal of Waste from Camp Lejeune:

Remove and dispose of rubbish and debris from Government property.

- (a) Provide 24-hour advance written notice to the Contracting Office of Contractor's intention to dispose of off base.
- (b) Disposal at sites or landfills not holding a valid state of North Carolina permit is specifically prohibited. The prohibition also applies to sites where a permit may have been applied for but not yet obtained.
- (c) Off-base disposal of construction debris outside the parameters of this paragraph at site without State permits and/or not in accordance with regulatory requirements will require the Contractor at his own expense to remove, transport and relocate the debris to a State approved site. The Contractor will also be required to pay any fines, penalties, or fees related to the illegal disposal of construction debris.

(d) Materials which may be deposited in the landfill include:

CATEGORY	CONSTRUCTION DEBRIS DISPOSAL - BASE SANITARY LANDFILL EXAMPLE/GENERAL INFORMATION FOR DEPOSIT IN THE LANDFILL
Recyclable Cardboard	Breakdown corrugated cardboard boxes and deliver to the Base Recycling Center located at Building 913. If Base personnel rejects the cardboard, remove from government property.
Asphalt Pavement	Remove pavement from Government property and deliver to an asphalt-recycling establishment. Provide a record of the total tons of asphalt recycled and the corporate name and location of the recycling establishment receiving the removed asphalt.
Asbestos	Asbestos will be accepted at the landfill.
Lead Based Paint and Materials	Well adhered lead containing paint debris as whole unit removal, will be accepted at the base landfill.

Lead scrapping chips from areas identified within the contract scope, after TCLP testing, will be disposed of at the base landfill if under 5 ppm; over 5 ppm is considered hazardous and will require manifesting per EMD rules and disposal off base at a certified, licensed disposal site.

#### Metals

Metals will not be accepted at the landfill. Remove metals from each and every category before delivery to the landfill. (Example: Remove hardware from doors and windows.)

Segregate metals and dispose of metal construction debris at Defense Reutilization Maintenance Office (DRMO) Building TC-861, Camp Geiger.

#### (2) Open Burning of Vegetative Debris for MCB Camp Lejeune and MCAS New River:

Open burning of vegetative debris is allowed in some cases. Contact **Captain Brian Woodall**, Camp Lejeune Air Quality Program Manager at (910) 451-5836 for the latest regulations, and requirements for open burning of vegetative debris.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 60 00.00 22

REQUIREMENTS FOR PESTICIDE AND HERBICIDE COORDINATION

11/14

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-07 Certificates

Certificate of North Carolina Licensed Applicator; G

SD-11 Closeout Submittals

Completed Field Pesticide/Herbicide Management Record Form; G

1.2 QUALITY ASSURANCE

1.2.1 Certificate of North Carolina Licensed Applicator

A North Carolina licensed applicator is required. Submit a copy of the certificate(s) to the Base Pest Management Coordinator (PMC) through the Contracting Officer.

PART 2 PRODUCTS

2.1 PESTICIDE/HERBICIDE LIST

The Contractor shall comply with Base Regulations and use only approved pesticides listed on the current "Approved Pesticide List for MCB Camp Lejeune NC". The attached document is current as of the date indicated but may be revised at any time. The approved list that is current at the time of application must be utilized. Contact the Contracting Officer to obtain the current approved list.

PART 3 EXECUTION

3.1 COORDINATION WITH BASE PEST MANAGEMENT COORDINATOR (PMC)

Contractor shall coordinate with the MCB Camp Lejeune PMC before proceeding with any pesticide/herbicide application.

3.2 Field Pesticide/Herbicide Management Record Form

Following the pesticide/herbicide application, the Contractor shall complete the attached Field Pesticide/Herbicide Management Record Form and submit to the Base Pest Management Coordinator (PMC) through the Contracting Officer. The completed form(s) shall be submitted within 15 days after application.

-- End of Section --

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# APPROVED PESTICIDE LIST FOR CAMP LEJEUNE NC

Per OPNAVINST 6250.4C "All personnel applying pesticides shall be certified"

## IPM - APPENDIX E

Updated: 10 February 2015

EPA Reg #	Trade Name	Intended Use	REMARKS
***Approve	Must be secured inside tamper-resistant bait boxes		
100-1055	WeatherBlok XT (formerly 10182-339) (NOTE: Must be secured inside tamper-resistant bait boxes)	Rodenticide	Approve:certified applicators only
100-1091	Reward (NSN#6840-01-005-7523)	AQUATIC weeds	Approve:certified applicators only
100-1111	Archer	Roaches	Approve:certified applicators only
100-1134	Monument 75WG	Weeds	Approve:certified applicators only
100-1139	Barricade 4FL	Insecticide	Approve:certified applicators only
100-1218	Demon Max	Insecticide	Approve:certified applicators only
100-834	Barricade 65 WG	Crabgrass,weeds	Approve:certified applicators only
100-937	Primo MAXX	Growth Regulator	Approve:certified applicators only
10182-100	Demon WP	Insecticide	Approve:certified applicators only
10182-105	Demon EC	Insecticide/Gen Household	Approve:certified applicators only
10182-339	Weather Block (NOTE:Must be secured inside tamper-resistant bait boxes)	Rodenticide	Approve:certified applicators only
10182-361	Demand CS	Insecticide	Approve:certified applicators only
1021-1641-57056	Conquer	Insecticide	Approve:certified applicators only
1021-1691-149	TERRO ANT KILLER SPRAY T401 (16 oz) "issued to units thru SELF HELP 451-0072 (WO needed)"	Ants	Approve: SELF HELP or certified applicators only
1021-1815	Onslaught Microencapsulated Insecticide	Insecticide	Approve:certified applicators only
11540-1	ULD BP-300	Insecticide	Approve:certified applicators only
11540-9	ULD BP-100	Insecticide	Approve:certified applicators only
11649-7	Avitrol Whole Corn (LABELED "RESTRICTED USE")	Avicide	Approve:certified applicators only
12455-69	Contrac Bait (NOTE: use only OUTSIDE of bldgs)	Rodenticide	Approve:certified applicators only
12455-79	Contrac All Weather Bait Blocks (NSN#6840-01-501-2858)	Rodenticide	Approve:certified applicators only
12455-82	Contrac Blox (Super Size)	Rodenticide	Approve:certified applicators only
149-8-64405	Terro Ant Bait Gel	Insecticide	Approve:certified applicators only
1812-307	K-Tea	Algaecide	Approve:certified applicators only
19713-60	Simazine 4L	Weeds & Vines	Approve:certified applicators only

19713-623	Drexel Imitator Aquatic Herbicide	Aquatic Weeds	Approve:certified applicators only
2217-774	Gordans Brushmaster	Poison Ivy/Vines	Approve:certified applicators only
2217-833	SpeedZone	Weeds	Approve:certified applicators only
2217-835	Southern Speedzone	Weeds	Approve:certified applicators only
228-480	Polaris AC (G10 Aerial Spray approved 5/18/2010)	Herbicide	Approve:certified applicators only
228-534	Polaris	Herbicide	Approve:certified applicators only
228-675	Nufarm Diquat SPC 2 L	Aquatic Weeds	Approve:certified applicators only
241-322	Amdro Pro Fire Ant Granular Bait	Ants	Approve:certified applicators only
241-341	Pendulum	Herbicide	Approve:certified applicators only
241-372	Sahara DG Herbicide	Cracks, Concrete	Approve:certified applicators only
241-392	Phantom (NSN#6840-01-525-7139)	Insecticide	Approve:certified applicators only
241-426	Habitat (NSN#6840-01-532-5403) (NOTE:only MCAS is approved for use to control alligator weeds)	Herbicide	Approve:certified applicators only
241-430	Chopper Gen2 (approved for Wildlife)	Herbicide	Approve:certified applicators only
2724-274	Golden Malrin (NSN#6840-01-183-7244)	Flying insects	Approve:certified applicators only
2724-351	Gentrol IGR (NSN#6840-01-318-7416)	Roaches	Approve:certified applicators only
2724-404-50809	Petcor Flea Spray	IGR	Approve:certified applicators only
2724-490	Precor 2000 Plus / Premise	Insecticide	Approve:certified applicators only
279-3062	Dragnet	Insecticide	Approve:certified applicators only
279-3168	Talstar PL	Insecticide	Approve:certified applicators only
279-3206	Talstar One (Pre-treat for Termites)(NSN#6840-01-525-6888)	Insecticide	Approve:certified applicators only
3125-390	Tempo Ultra WP	Insecticide	Approve:certified applicators only
352-439	Escort XP	Kudzu	Approve:certified applicators only
352-627	Advion Fire Ant Bait Granular	Insecticide	Approve:certified applicators only
352-643	TranXit	Weeds	Approve:certified applicators only
352-652	Advion Cockroach Gel Bait	Insecticide/Roaches	Approve:certified applicators only
352-668	Advion Roach Arena	Roaches	Approve:certified applicators only
352-746	Advion Ant Gel Bait	Ants	Approve:certified applicators only
352-776	Arilon	Insecticide	Approve:certified applicators only
42750-29	Weed-Hoe 108	Weeds	Approve:certified applicators only



432-1217	TOP CHOICE Fire Ant / Fipronil (NSN#6840-01-585-9950)	Insecticide/Fire Ants	Approve:certified applicators only
432-1223	ProStar 70 WP	Fungicide	Approve:certified applicators only
432-1254	Maxforce Gel Bait	Roaches	Approve:certified applicators only
432-1256	Maxforce Ant Bait Stations (NSN#6840-01-298-1122)	Insecticide	Approve:certified applicators only
432-1257	Maxforce FC (Sml Roach)	Insecticide	Approve:certified applicators only
432-1264	Maxforce FC Ant Killer Bait Gel (NSN#6840-01-500-4579)	Insecticide	Approve:certified applicators only
432-1331	Premise (Pre Construction Insecticide)	Insecticide	Approve:certified applicators only
432-1332	Premise 75 / Centerfire 75 WSP	Termites	Approve:certified applicators only
432-1332-73748	Imaxx Pro	Insecticide	Approve:certified applicators only
432-1363	Bayer Tempo Ultra SC	Insecticide	Approve:certified applicators only
432-1375	Maxforce Fly Granular Bait (NSN#6840-01-518-5807)	Flying insects	Approve:certified applicators only
432-1391	Premise Foam	Termites	Approve:certified applicators only
432-1433	MaxForce FC Fire Ant Bait	Insecticide	Approve:certified applicators only
432-1455	Maxforce Fly Spot Bait (NSN#6840-01-555-9369)	Insecticide	Approve:certified applicators only
432-1460	Maxforce FC Magnum Roach Killer Bait Gel	Insecticide/Roaches	Approve:certified applicators only
432-1483	Temprid SC	Ants, Roaches	Approve:certified applicators only
432-1514	Suspend Polyzone	Insecticide	Approve:certified applicators only
432-716	SCOURGE (LABELED "RESTRICTED USE")	Insecticide	Approve:certified applicators only
432-763	Suspend SC	Ants	Approve:certified applicators only
432-772	Delta Dust (NSN#6840-01-431-3345)	Bees, Wasps, Hornets	Approve:certified applicators only
432-992	Drione Dust	Insecticide/Gen Household	Approve:certified applicators only
499-153	Whitmire Wasp Freeze	Insecticide	Approve:certified applicators only
499-290	PT 565 Plus XLO (NSN#6840-00-823-7849)	Roaches	Approve:certified applicators only
499-294	Avert Dry Flowable Cockroach Bait/ Whitmire AvertPT310 Abamectin Dust (NSN#6840-01-561-9766)	Insecticide/Roaches	Approve:certified applicators only
499-304	Cy-Kick CS Prescription Treatment	Insecticide	Approve:certified applicators only
499-310	Whitmire PT 566 Pyrethrum	Insecticide	Approve:certified applicators only
499-362	Wasp Freeze / Wasp Stopper II Plus / Whitmire PT 515 Wasp Freeze (NSN#6840-00-459-2243)	Wasps, bees, hornets	Approve:certified applicators only
499-385	Tri-Die	Insecticide	Approve:certified applicators only
499-404	Ultracide Flea IGR & Adulticide	Insecticide	Approve:certified applicators only

499-450	BP-100	Insecticide	Approve:certified applicators only
499-452	BP-300	Insecticide	Approve:certified applicators only
499-462	Pro-Control Plus	Insecticide	Approve:certified applicators only
499-465	Pro-Control	Insecticide	Approve:certified applicators only
499-470	Cy-Kick (NSN#6840-01-561-9717)	Insecticide	Approve:certified applicators only
499-473	Whitmire PT 221L Residual Insecticide	Insecticide	Approve:certified applicators only
499-527	PT Alpine Dust	Insecticide	Approve:certified applicators only
499-535	Cyhalocap CS	Pesticide	Approve:certified applicators only
499-540	Alpine Flea Insecticide	Insecticide	Approve:certified applicators only
499-561	Alpine WSG	Insecticide	Approve:certified applicators only
56-73	JT Eaton Boric Acid	Insecticide	Approve:certified applicators only
50404-5	Permethrin	Insecticide	Approve:certified applicators only
50534-202	Daconil Ultrex	Fungicide	Approve:certified applicators only
524-343	Aqua Master	AQUATIC Herbicide	Approve:certified applicators only
524-454	Honcho Plus Herbicide (G10 Aerial Spray approved 5/18/2010)	Weeds & Vines	Approve:certified applicators only
524-475	ROUND-UP PRO / Ranger Pro (NSN#6840-01-108-9578)	Herbicide/Weeds	Approve:certified applicators only
524-529	ROUND-UP PRO Concentrate	Herbicide/Weeds	Approve:certified applicators only
524-535	Quick Pro ROUND-UP (NSN#6840-01-399-0673)	Herbicide/Weeds	Approve:certified applicators only
524-549	ROUND-UP Powermax	Herbicide/Weeds	Approve:certified applicators only
53871-3	Stimukill Fly Bait	Insecticide	Approve:certified applicators only
53883-118	Bifenthrin	Insecticide	Approve:certified applicators only
53883-124	Bifen LP Granules	Insecticide	Approve:certified applicators only
53883-328	Fuse	Termiticide/Insecticide	Approve:certified applicators only
55809-3	Wasp & Hornet Killer Plus "Available SERVMART-GSA or issued to units thru SELF HELP 451-0071 (WO needed)"	Insecticide	Approve: SERVMART-GSA / SELF HELP or certified applicators only
58007-1	Ultrathon Insect Repellant	Insecticide	Approve:certified applicators only
59639-31	Orthene PCO Pellets	Insecticide	Approve:certified applicators only
6218-47	Mosquito Dunks	Insecticide	Approve:certified applicators only
62719-260	Crossbow Brush Killer	Weeds & Vines	Approve:certified applicators only
62719-324	Rodeo / Accord (NSN#6840-01-356-8893)	AQUATIC herbicide	Approve:certified applicators only

62719-40	GARLON 4 / Element 4	Kudzu	Approve:certified applicators only
62719-426	Dimension EC	Weeds	Approve:certified applicators only
62719-553	Garlon XRT (G10 Aerial Spray approved 5/18/2010)	Herbicide	Approve:certified applicators only
63120-1	Insect/Arthropod Repellent Fabric Treatment (NSN#6840-01-334-2666) (Note:PrevMed Use only)	Insecticide	Approve:certified applicators only
63120-3	Insect/Arthropod Repellent Fabric Treatment (NSN#6840-01-345-0237) (Note:PrevMed Use only)	Insecticide	Approve:certified applicators only
64248-10	Maxforce Ant Bait F1	Insecticide	Approve:certified applicators only
64248-14	Maxforce FC Roach Killer Bait Gel	Insecticide	Approve:certified applicators only
64248-6	Maxforce Ant Killer/Granular Bait	Insecticide	Approve:certified applicators only
64405-1	Bora-Care	Insect/Fungicide	Approve:certified applicators only
64405-2	Niban Fine Granular Bait	Fire Ants	Approve:certified applicators only
64405-8	Tim-Bor	Wood Destroying Fungi	Approve:certified applicators only
655-798	ExciteR	Insecticide	Approve:certified applicators only
655-802	Larva-Lur	Insecticide	Approve:certified applicators only
66222-22	PRAMITOL 25E (NSN#6840-00-145-0013)	Weeds	Approve:certified applicators only
67425-15	EcoPCO WPX	Insecticide	Approve:certified applicators only
6754-22-5802	Drione	Insecticide	Approve:certified applicators only
67760-34	Malathion	Insecticide	Approve:certified applicators only
6959-79	CESSCO 5 E	Insecticide	Approve:certified applicators only
71995-33	7113) "issued to units thru SELF HELP 451-0072 (WO needed)"	Weeds	Approve: SELF HELP or certified applicators only
71995-36	ROUND-UP READY TO USE-PLUS POISON IVY "issued to units thru SELF HELP 451-0072 (WO needed)"	Poison Ivy/Vines	Approve: SELF HELP or certified applicators only
72155-58	Tempo 2.5 SC Ultra	Insecticide	Approve:certified applicators only
73342-1	AMDRO Fire Ant Bait "issued to units thru SELF HELP 451-0072 (WO needed)"	Fire Ants	Approve: SELF HELP or certified applicators only
73342-6	AMDRO Fire Ant Bait	Fire Ants	Approve:certified applicators only
73079-2	In Tice granular bait	Roaches	Approve:certified applicators only
73079-4	BorActin Insecticide Powder	Insecticide	Approve:certified applicators only
73079-6	InTice Perimeter Baits	Insecticide	Approve:certified applicators only
73079-8	InTice Gelanimo Ant Bait	Insecticide	Approve:certified applicators only

7969-209	Termidor 80 WG (NSN#6840-01-483-3072)	Termites	Approve:certified applicators only
7969-210	Termidor SC T/L (NSN#6840-01-483-3068)	Termites	Approve:certified applicators only
7969-272	Drive XLR8	Grasses	Approve:certified applicators only
7969-285	PT Phantom Pressurized Insecticide	Insecticide	Approve:certified applicators only
8033-109-279	Transport Mikron	Insecticide	Approve:certified applicators only
81927-7	Alligare MSM 60 (Base Stables)	Herbicide	Approve:certified applicators only
81927-11	Triclopyr 4E	Kudzu	Approve:certified applicators only
8329-40	Biomist 1.5+7.5 ULV	Mosquitos	Approve:certified applicators only
83487-1	Uncle Albert's Super Smart Ant Bait	Insecticide	Approve:certified applicators only
901-82	d-Phenothrin	Insecticide	Approve:certified applicators only
9444-129	Borid	Insecticide	Approve:certified applicators only
9444-183	Intruder HPX Aerosol	Roaches	Approve:certified applicators only
9444-217	D-Force HPX (NSN#6840-01-561-9745)	Insecticide	Approve:certified applicators only
9688-187	TAT ANT & ROACH KILLER SPRAY (12 oz) "issued to units thru SELF HELP 451-0072 (WO needed)"	Ants/Roaches	Approve: SELF HELP or certified applicators only
9688-239-8845	HotShot Ultra LIQUID Roach Baits "issued to units thru SELF HELP 451-0072 (WO needed)"	Insecticide	Approve: SELF HELP or certified applicators only
9688-242-8845	HotShot Ultra LIQUID Ant Baits "issued to units thru SELF HELP 451-0072 (WO needed)"	Insecticide	Approve: SELF HELP or certified applicators only
	<b>***BELOW LIST DOES NOT REQUIRE CERTIFIED APPLICATORS (NOT REGULATED OR EXEMPT)***</b>		
FIFRA Exempt	Eco Exempt IC	Insecticide	Approve:certified applicators NOT required
Not regulated	Bac A Zap	Bacteria/Odor/Drain Fly	Approve:certified applicators NOT required
Not regulated	Deer Stopper Concentrate-Messina Wildlife	Deer	Locally approved:certified applicators NOT required
Not regulated	Osmocote Slow Release	Fertilizer not pesticide	Approve:certified applicators NOT required
Not regulated	Kleer-Out - Geraniol	Fire Ants	Locally approved:certified applicators NOT required
Not regulated	EcoSMART (Flying & Crawling Insects) (available thru <a href="#">SERVMART-GSA</a> )	Flying & Crawling insects	Locally approved:SERVMART-GSA / certified applicators NOT required
Not regulated	Liquid Fertilizer	Housing area	Approve:certified applicators NOT required
Not regulated	Eco Exempt D	Insecticide	Approve:certified applicators NOT required
Not regulated	Eco Exempt G	Insecticide	Approve:certified applicators NOT required

Not regulated	Mosquito Barrier	Mosquitos	Approve:certified applicators NOT required
Not regulated	Allure Pheromone Moth Traps	Moth	Approve:certified applicators NOT required
Not regulated	StorGard Pheromone Traps	Moth	Approve:certified applicators NOT required
Not regulated	CatchMaster Glueboards	Rodents & Insects	Approve:certified applicators NOT required
Not regulated	Predascent ( <a href="#">available thru SERVMART-GSA</a> )	Snake Repellent	Approve:SERVMART-GSA / certified applicators NOT required
Not regulated	Pyrethiums	Fruit Bug	Approve:certified applicators NOT required
Not regulated	Cazamoscas Fly Catcher (Base Stables)	Flys	Approve:certified applicators NOT required
Not regulated	Snake-A-Way	Repellent	Approve:certified applicators NOT required

Camp Lejeune Pest Management Coordinator:

William Parkin (Environmental Management Department) (910) 451-7018 email [william.parkin@usmc.mil](mailto:william.parkin@usmc.mil)

Link to the AUL for the PMP:

For External Site: <http://www.lejeune.marines.mil/OfficesStaff/EnvironmentalMgmt/HazardousWasteMaterialManagement.aspx>

For Internal Site :<https://em.usmc.mil/sites/le/default.aspx>

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SECTION 01 74 19.05 20

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD  
05/13

PART 1 GENERAL

1.1 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

1.2 PLAN

A waste management plan shall be submitted within 15 days after **notice to proceed** and prior to initiating any site preparation work. The plan shall include the following:

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management.
- b. Actions that will be taken to reduce solid waste generation.
- c. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas and equipment to be used for processing, sorting, and temporary storage of wastes.
- d. Characterization, including estimated types and quantities, of the waste to be generated.
- e. Actions that will be taken to divert at least 50% of the non-hazardous solid wastes (including waste from construction and demolition operations) from the waste stream. Report actual diversion rates during construction and demolition.
- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.
- h. List of specific waste materials that will be salvaged for resale, salvaged and reused, or recycled. Recycling facilities that will be used shall be identified. Provide percentage of non-hazardous construction and demolition waste materials that have been diverted from the waste stream.
- i. Identification of materials that cannot be recycled/reused with an explanation or justification.

- j. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

### 1.3 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Report with monthly invoicing the tons diverted, the tons sent to the landfill, cost for each, and the monthly diversion rate. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be delivered to the Contracting Officer upon completion of the construction.

### 1.4 DISPOSAL

Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

#### 1.4.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered. Salvaged materials, other than those specified in other sections to be salvaged and reinstalled, shall not be used in this project.

#### 1.4.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling whenever economically feasible.

#### 1.4.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

-- End of Section --



SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

11/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E1971 (2005; R 2011) Stewardship for the  
Cleaning of Commercial and Institutional  
Buildings

1.2 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors must compile and prepare data and deliver to the Contractor prior to the training of Government personnel. The Contractor must compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section, [Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION \(eOMSI\)](#), and [Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES](#).

1.2.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.2.2 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission, except as follows. Commissioned items without a specified data package requirement in the individual technical sections must use Data Package 5. Commissioned items with a Data Package 1 or 2 requirement must use instead Data Package 5.

1.2.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data must be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of

submitted data within 30 calendar days of the notification of this change requirement.

#### 1.2.4 Review and Approval

The Contractor's Commissioning Authority (CA) must review the commissioned systems and equipment submittals for completeness and applicability. The CA must verify that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. The CA must communicate deficiencies to the Contracting Officer. Upon a successful review of the corrections, the CA must recommend approval and acceptance of these O&M manuals to the Contracting Officer. This work is in addition to the normal review procedures for O&M data.

#### 1.2.5 O&M Database

Develop a database from the O&M manuals that contains the information required to start a preventative maintenance program.

### 1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

#### 1.3.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

##### 1.3.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

##### 1.3.1.2 Operator Prestart

Include procedures required to install, set up, and prepare each system for use.

##### 1.3.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

##### 1.3.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

##### 1.3.1.5 Emergency Operations

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and

zones or portions of systems controlled.

#### 1.3.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

#### 1.3.1.7 Environmental Conditions

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

#### 1.3.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

##### 1.3.2.1 Lubrication Data

Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":

- a. A table showing recommended lubricants for specific temperature ranges and applications.
- b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.
- c. A Lubrication Schedule showing service interval frequency.

##### 1.3.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

##### 1.3.2.3 Cleaning Recommendations

Provide environmentally preferable cleaning recommendations in accordance with [ASTM E1971](#).

#### 1.3.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

#### 1.3.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

#### 1.3.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

#### 1.3.3.3 Maintenance and Repair Procedures

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

#### 1.3.3.4 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

#### 1.3.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

#### 1.3.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

#### 1.3.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

##### 1.3.5.1 Product Submittal Data

Provide a copy of all SD-03 Product Data submittals required in the applicable technical sections.

##### 1.3.5.2 Manufacturer's Instructions

Provide a copy of all SD-08 Manufacturer's Instructions submittals required

in the applicable technical sections.

#### 1.3.5.3 O&M Submittal Data

Provide a copy of all SD-10 Operation and Maintenance Data submittals required in the applicable technical sections.

#### 1.3.5.4 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog

#### 1.3.5.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

#### 1.3.5.6 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

#### 1.3.5.7 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

#### 1.3.5.8 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.

#### 1.3.5.9 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product,

equipment, and system manufacturers.

#### 1.4 TYPES OF INFORMATION REQUIRED IN CONTROLS O&M DATA PACKAGES

Include Data Package 5 and the following for control systems:

- a. Narrative description on how to perform and apply all functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.
- b. Full as-built sequence of operations.
- c. Copies of all checkout tests and calibrations performed by the Contractor (not Cx tests).
- d. Full points list. A listing of rooms shall be provided with the following information for each room:
  - (1) Floor
  - (2) Room number
  - (3) Room name
  - (4) Air handler unit ID
  - (5) Reference drawing number
  - (6) Air terminal unit tag ID
  - (7) Heating and/or cooling valve tag ID
  - (8) Minimum cfm
  - (9) Maximum cfm
- e. Full print out of all schedules and set points after testing and acceptance of the system.
- g. Electronic File:
  - (1) Assemble each manual into a composite electronically indexed file in PDF format. Provide HDD's, DVD's or CD's as appropriate, so that each one contains all maintenance and record files, and also the Project Record Documents and Training Videos, of the entire program for this facility.
  - (2) Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
  - (3) Link the index to separate files within the composite of files. Book mark maintenance and record files, that have a Table of Contents, according to the Table of Contents
- h. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.

## 1.5 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M data packages specified in individual technical sections.  
The required information for each O&M data package is as follows:

### 1.5.1 Data Package 1

- a. Safety precautions
- b. Cleaning recommendations
- c. Maintenance and repair procedures
- d. Warranty information
- e. Contractor information
- f. Spare parts and supply list

### 1.5.2 Data Package 2

- a. Safety precautions
- b. Normal operations
- c. Environmental conditions
- d. Lubrication data
- e. Preventive maintenance plan and schedule
- f. Cleaning recommendations
- g. Maintenance and repair procedures
- h. Removal and replacement instructions
- i. Spare parts and supply list
- j. Parts identification
- k. Warranty information
- l. Contractor information

### 1.5.3 Data Package 3

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Environmental conditions

- g. Lubrication data
- h. Preventive maintenance plan and schedule
- i. Cleaning recommendations
- j. Troubleshooting guides and diagnostic techniques
- k. Wiring diagrams and control diagrams
- l. Maintenance and repair procedures
- m. Removal and replacement instructions
- n. Spare parts and supply list
- o. Product submittal data
- p. O&M submittal data
- q. Parts identification
- r. Warranty information
- s. Testing equipment and special tool information
- t. Testing and performance data
- u. Contractor information

1.5.4 Data Package 4

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Operator service requirements
- g. Environmental conditions
- h. Lubrication data
- i. Preventive maintenance plan and schedule
- j. Cleaning recommendations
- k. Troubleshooting guides and diagnostic techniques
- l. Wiring diagrams and control diagrams
- m. Maintenance and repair procedures



- n. Removal and replacement instructions
- o. Spare parts and supply list
- p. Corrective maintenance man-hours
- q. Product submittal data
- r. O&M submittal data
- s. Parts identification
- t. Warranty information
- u. Personnel training requirements
- v. Testing equipment and special tool information
- w. Testing and performance data
- x. Contractor information

1.5.5 Data Package 5

- a. Safety precautions
- b. Operator prestart
- c. Start-up, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Environmental conditions
- f. Preventive maintenance plan and schedule
- g. Troubleshooting guides and diagnostic techniques
- h. Wiring and control diagrams
- i. Maintenance and repair procedures
- j. Removal and replacement instructions
- k. Spare parts and supply list
- l. Product submittal data
- m. Manufacturer's instructions
- n. O&M submittal data
- o. Parts identification
- p. Testing equipment and special tool information

- q. Warranty information
- r. Testing and performance data
- s. Contractor information

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 78 24.00 20

FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI)  
11/14

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

This section provides the requirements for electronic operation and maintenance support information (eOMSI). eOMSI contains detailed as-built information describing the efficient, economical, safe operation, maintenance, and repair of the facility. eOMSI is required to be in electronic format divided into the eOMSI Data and eOMSI Document files.

- a. Provide eOMSI Data files in the eOMSI Spreadsheet Workbook format that are uploaded by the Government into a Government computerized maintenance management system (CMMS). Maximo is the CMMS that will be used on this project.
- b. Provide eOMSI Document files in Portable Document Format (PDF), Computer Assisted Design and Drafting (CADD), and MS Word formats that can be uploaded into a document management system. The eOMSI document information is to be factual, concise, comprehensive, and written to be easily used by maintenance personnel. Descriptive matter and theory must include technical details that are essential for a comprehensive understanding of the operation, maintenance and repair of the system. The eOMSI Preparer shall ensure that the eOMSI reflect changes to systems and equipment, made during construction.

1.2 DEFINITIONS

1.2.1 Component Inventory Management Unit (CIMU)

CIMU is an organization of like-kind real property into manageable maintenance units. CIMU is a building component, group of components or component assemblies, serving a specific purpose in a facility that can be expected to follow a common and predictable lifecycle behavior. This class of non-equipment will include items such as exterior walls, exterior windows, interior finish, and roofs. This class of equipment will include items such as fan coil units, air handling units, lighting, and water closets. CIMUs can include items of installed equipment typically subject to routine scheduled maintenance.

1.2.2 Real Property Inventory Equipment (RPIE)

RPIE is a Government owned or leased individual pieces of equipment, apparatus, or fixture that are essential to the function of the real property (i.e. plumbing, electrical, heating, cooling and elevators). It is physically attached to, integrated into, and built in or on the property. Individual RPIE's can be combined to make a CIMU to facilitate facilities management.

1.2.3 BOTH (Combined CIMU and RPIE)

A BOTH is a stand-alone piece of equipment that can be managed independently and therefore is a Component Inventory Management Unit and a Real Property Installed Equipment. (If a CIMU has a Quantity of "One", it

would be considered a BOTH)

#### 1.2.4 Utility and Energy Management (UEM)

UEM is a part of the Government Public Works (PW) Organization that manages the operation and maintenance of the Base utilities.

#### 1.2.5 Systems

The words "system", "systems", and "equipment", when used in this document refer to as-built systems and equipment.

#### 1.2.6 Computer Assisted Design and Drafting (CADD)

Electronic Computer Assisted Design and Drafting graphic software program that is used to create facility design contract documents.

#### 1.2.7 eOMSI Spreadsheet Workbook

The eOMSI Spreadsheet Workbook is a group of Excel spreadsheets that provide forms, samples, and tools to assist the Contractor in identifying equipment and non-equipment data for the project. Use these Excel spreadsheets to organize and record maintenance data for the project. Use the eOMSI Spreadsheet Workbook in conjunction with this specification section with the file title: "eOMSI\_spreadsheet\_wkbk\_new\_constr.xls" located inside the zip file at the following web link:

[http://www.wbdg.org/ccb/DOD/UFGS SUPPLEMENTS/UFGS 01 78 24.00 20 eOMSI spreadsheet.zip](http://www.wbdg.org/ccb/DOD/UFGS_SUPPLEMENTS/UFGS_01_78_24.00_20_eOMSI_spreadsheet.zip)

#### 1.2.8 Flat File

The flat file is the blank forms portion of the eOMSI Spreadsheet Workbook used to fill in the equipment and non-equipment data. These flat file forms are Excel templates with column headings that identify required information for equipment and non-equipment. The data placed on the flat file spreadsheets are organized by the Contractor into RPIE, and BOTH maintenance units.

#### 1.2.9 KTR

KTR is an abbreviation for "Contractor."

### 1.3 ORGANIZATION of eOMSI

Prepare the eOMSI submittals in two components, eOMSI Data Files and eOMSI Document Files.

#### 1.3.1 eOMSI Data Files

Provide facility specific information listed in the DESCRIPTION of WORK of this specification section and divide into Equipment Data and Non-Equipment Data on eOMSI Spreadsheet Workbook / Flat Files. The Government will use the completed eOMSI Spreadsheet Workbook to update information of the CMMS indicated above. The following tabs are included in the eOMSI Spreadsheet Workbook and serve the purpose stated:

- a. Flat File - Equipment Data; This spreadsheet provides an organized format for the contractor to fill in required information about dynamic equipment (fans, pumps,...) that is part of the project.

- b. **Flat** File - Non-Equipment Data; This spreadsheet provides an organized format for the Contractor to fill in required information about non-equipment (doors, windows, etc.) that is part of the project.
- c. **New** CONST - RENOVATION Schema; Provides information and instructions to explain the task of completing the Flat File - Equipment Data and Flat File - No-Equipment Data spreadsheets.
- d. **Facility** and UEM Unifomat; Provides a Unifomat division of facility and utility systems and components of the project. This information is used to complete the Master-System-Subsystem portions of the Flat File - Equipment Data and Flat File - Non-Equipment Data spreadsheets.
- e. **UEM** Asset Classification: Provides a list of critical Utility and Energy Management components that must be identified in the Flat File - Equipment Data spreadsheet.
- f. **Asset** Identification List: List of items that require equipment tagging. Tag numbering must be entered in the Equipment Tag Number of the Flat File - Equipment Data spreadsheet.
- g. **Data** Definitions; Provide definitions of terms used on the spreadsheet workbook.

#### 1.3.2 eOMSI Document Files

Provide facility specific information, which was used to construct the project and provide information on operation and maintenance of the facility in a form that can be easily accessed and used. Organize the document files to facilitate storage in an electronic Government document file management system. Arrange the eOMSI Documents files in the following order and identify the document files as follows:

- a. **Facility** Information
- b. **Primary** Systems Information
- c. **Product** and Drawing Information

Cross-referencing within or between the eOMSI Document File parts must be specific.

#### 1.3.3 Order of Precedence of eOMSI Requirements

This specification section takes precedence over the eOMSI Spreadsheet Workbook in the event of conflict between this specification section and the eOMSI Spreadsheet Workbook.

#### 1.3.4 Sources of eOMSI Information

The sources of data needed to prepare the eOMSI include, but are not limited to, the design plans and specifications, field visits, approved construction submittals and manufacturer's catalog data for materials, products, systems, as-built drawings, contract modifications, and construction methods used in this contract. Ensure that the eOMSI reflect changes to systems and equipment made during construction as a result of contract modifications. Collect and input needed information to complete the data and document files

### 1.3.5 Unified Facility Guide Specifications (UFGS) Operation and Maintenance Data Packages

Provide information necessary to maintain the equipment and non-equipment of the facility by utilizing the SD-10 Operations and Maintenance Data Packages as defined in [Section 01 78 23 OPERATIONS AND MAINTENANCE DATA](#). Provide the SD-10 Data Packages required in the individual sections for each product, material, and system used on the project.

### 1.4 eOMSI MEETINGS

Organize, coordinate, and facilitate the meetings necessary to obtain the information to complete the eOMSI submittal.

#### 1.4.1 eOMSI Start-Up Meeting

During the [Post Award Kickoff Meeting](#), discuss the following;

- a. [The](#) eOMSI Development Meetings schedules and participants.
- b. [Processes](#) and methods of gathering of facility eOMSI information during construction.
- c. [The](#) qualifications of the eOMSI Preparer.
- d. [The](#) eOMSI Submittals schedule. Place the eOMSI submittal schedule on the construction schedule.

#### 1.4.2 eOMSI Development Meetings

Meet with key personnel to discuss the eOMSI requirements and the deliverables. These are a series of meetings that begin after the [Post Award Kickoff Meeting](#) and conclude with the Contractor's first eOMSI submittal. Include the eOMSI Preparer, Commissioning Authority (CA) and the Quality Control Manager to attend these meetings. Also include the Mechanical, Electrical and Fire Protection Sub Contractors as required. The purposes of these meetings are to:

- a. [Familiarize](#) the Contractor with the Government PW maintenance processes.
- b. [Provide](#) the Contractor with an understanding of the RPIE, CIMU, and BOTH to organize the facility into these information structures.
- c. [Obtain](#) the "By KTR Using Government Info" information for the eOMSI Flat File Spreadsheets.
- d. [Review](#) and identify the electronic format, units of measure, titles, and wording necessary to load the eOMSI data into the designated Government CMMS and eOMSI documents into the Government Document Management System.
- e. [Review](#) progress of eOMSI development and discuss issues that need to be resolved.
- f. [Coordinate](#) requirements for eOMSI training.

#### 1.4.3 Field Validation Meetings

Meet with key personnel to determine the accuracy of the eOMSI Data and

Documents as described in this specification. Include the Subcontractors as required to verify as-built conditions.

#### 1.4.4 Facility Turnover Meetings

Refer to paragraph FACILITY TURNOVER PLANNING MEETINGS in Section 01 31 19.05 20 POST AWARD MEETINGS for eOMSI facility turnover meeting requirements.

#### 1.5 UNITS of MEASURE

Provide eOMSI utilizing the units of measure required by the RFP for the facility. Refer to Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES. Metric eOMSI shall be in SI (System International) metric units exclusively.

#### 1.6 QUALIFICATIONS of eOMSI PREPARER

Submit Qualifications of eOMSI Preparer that meet the following:

- a. Possess multidiscipline technical knowledge of the operations and maintenance of building systems.
- b. Experience with the type of systems that are identified in this specification and capable of augmenting manufacturer's information to clarify operations instructions.
- c. Experience preparing detailed Operations and Maintenance Manuals for facilities of equal size and complexity as required by this contract
- d. Ability to prepare spreadsheets to be loaded into a CMMS.
- e. Experience presenting training and coordinating a team of manufacturer's representatives to provide training of Facility Users and Maintenance Personnel.

#### 1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation for submittals found in RFP PART 2. Additional construction submittals reserved for Government approval are listed in the Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES. Submittals with a "G" designation found in the sections used by the Contractor to create construction specification, require DOR approval. DOR approved submittals are also listed in the "CONSTRUCTION SUBMITTALS" paragraph in each RFP PART 4, Performance Technical Specifications. Submit the following in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

##### SD-07 Certificates

Qualifications of eOMSI Preparer; G

##### SD-10 Operation and Maintenance Data

Training Plan; G

For each training session; submit dates start and finish times, and locations; outline of the information to be presented; names

and qualifications of the presenters; and list of texts and other materials required to support training.

Training Outline; G

Training Content; G

#### SD-11 Closeout Submittals

eOMSI, Preliminary Submittal; G

eOMSI, 100 percent, Prefinal Submittal; G

eOMSI, Final Submittal; G

Training Video Recording; G

Validation of Training Completion; G

### 1.8 SUBMITTAL FORMAT

#### 1.8.1 eOMSI Data Files

Provide eOMSI data on compact disks (CD) or data digital versatile disk (DVD) disks in formats that are compatible with those used on the project. Provide eOMSI Data information by completing the eOMSI Spreadsheet Workbook / Flat File initial templates:

- a. eOMSI Spreadsheet Workbook / Flat File - Equipment Data tab; Provide information to all spreadsheet fields. Obtain the information indicated to be supplied "By KTR using Government info" from the Contracting Officer / Facility Maintenance Specialist (FMS) and fill in this part of the Flat File. Typically identify individual pieces of equipment by RPIE. Group equipment with similar Uniformat classification, design life, install date, remaining service life, and direct condition rating - into manageable CIMUs. Except, when the individual RPIE is complex enough to require its own management planning and in this case the individual RPIE is also a BOTH. Each CIMU shall be greater than \$2,500 in value.
- b. eOMSI Spreadsheet Workbook / Flat File - Equipment Data tab; Provide information to all spreadsheet fields. Group Non-equipment with similar Uniformat classification, design life, install date, remaining service life, and direct condition rating - into manageable CIMUs. Obtain the information indicated to be supplied "By KTR using Government info" from the Contracting Officer / FMS to complete that portion of the Flat File. Each CIMU shall be greater than \$2,500 in value.

#### 1.8.2 eOMSI Document Files

Provide eOMSI document files on CD or data DVD disks using the most current version of Adobe Acrobat or similar software capable of producing PDF files that can be used to upload the files into an electronic Government document management system. Bookmark the PDF files for easy access to the information. Bookmark Facility Information and Primary Systems Information to at least one level lower than the major system. Bookmark Product and Drawing Information documents using the current version of Masterformat and arrange submittals using the specification sections as a structure. Use Masterformat and UFGS numbers along with descriptive bookmarking titles



that explain the content of the information that is being bookmarked.

Provide the following information on the compact disk label and disk holder/ case:

- a. Building Number
- b. Project Title
- c. Activity and Location
- d. Construction Contract Number
- e. Prepared For: (Contracting Agency)
- f. Prepared By: (Name, title, phone number and email address)
- g. Include the compact disk content on the disk label
- h. Date
- i. Virus scanning program used

#### 1.9 SUBMITTAL SCHEDULE

Provide the following eOMSI submittals. Scan electronic files of eOMSI Data and eOMSI Documents for malicious viruses using a commercially available scanning program that is routinely updated to identify/remove current virus threats.

##### 1.9.1 eOMSI, Preliminary Submittal

Submit the Preliminary submittal when construction is approximately 50 percent complete;

- a. eOMSI Data Files.(Excel)
- b. eOMSI Document Files (Bookmarked PDF) that include:
  - (1) Facility Information
  - (2) Primary Systems Information
  - (3) Product and Drawing Information

Provide four electronic copies to the Contracting Officer for approval. Provide the submittal in sufficient detail to allow the Government to substantiate that the data collection, detail of discussion, and information organization of both the data and document files are in accordance with the contract. Include in the submittal, as a minimum, all available Facility Information; all systems of the Primary Systems Information (at least one system to be essentially complete and the remaining systems shall be at least 50 percent complete); and at least two Masterformat divisions of the completed Product Data.

##### 1.9.1.1 Preliminary eOMSI Submittal Review Duration

Allow the Government a minimum of 30 calendar days to review and comment on the submittal, from the time the Government receives the Preliminary eOMSI

submittal.

#### 1.9.2 100 percent - Prefinal eOMSI Submittal

Submit four electronically formatted copies of the 100 percent submittal of the eOMSI Data File and eOMSI Document File to the Contracting Officer for approval. The [eOMSI, 100 percent, Prefinal Submittal](#) is due 60 calendar days prior to Beneficial Occupancy Date (BOD)/ Placed In Service Date. This submittal shall be a complete, working document that can be used to operate and maintain the facility. Any portion of the submittal that is incomplete or inaccurate will require the entire submittal to be returned for correction. Incorporate all Government requested changes from the Preliminary submittal and the eOMSI Development Meetings comments into the Prefinal submission. Provide the same information required for each eOMSI document file CD/ DVD disk label, on the introductory page of each eOMSI submittal volume. Refer to paragraph titled "eOMSI Document Files" of this section for a list of this required introductory page information.

Submit the Prefinal submittal when construction is 90 percent complete that include;

- a. [eOMSI Data Files](#). (Excel)
- b. [eOMSI Document Files](#) (Bookmarked PDF) that include;
  - (1) Facility Information
  - (2) Primary Systems Information
  - (3) Product and Drawing Information

##### 1.9.2.1 Prefinal eOMSI Submittal Review Duration

Allow the Government a minimum of 30 calendar days to review and approve the submittal, from the time the Government receives the Prefinal eOMSI submittal. If the Prefinal submittal is required to be resubmitted, the Government review of subsequent submittals shall have the same review duration as the first submittal. No extension in project completion date will be granted due to resubmittal.

#### 1.9.3 [eOMSI, Final Submittal](#)

Complete the eOMSI Data and Documents and provide Final submittal in Excel and bookmarked PDF format as required in the Prefinal Submittal. Deliver submittals to the Contracting Officer for approval. The Final submittal is due at BOD/ Placed in Service Date. Include all Government requested changes from the Prefinal submittal, Field Validation, and the Project Closeout Meetings to complete the Final submittal.

In addition to the formats stated above, provide four electronic copies of the Final submittal in editable formats. Provide editable eOMSI Document drawing and diagram files in CADD and other editable eOMSI Document files in MS Word or Excel. Refer to Product and Drawing Information below to describe the format of the Record Drawings submission.

#### 1.10 FACILITY SYSTEMS

The project is anticipated to include the following critical systems. Provide eOMSI data, eOMSI documents, and training for all products,

materials, and equipment that make up these systems in the final constructed facility, including the following systems:

- a. HVAC facility systems (including chillers, boilers, heat pumps, air handling equipment, exhaust fans, fan coil units, VAV boxes, heat recovery wheels, hot and chilled water hydronic systems, control valves, and backflow preventers)
- b. Direct Digital Controls/Space Temperature Controls
- c. Steam condensate pumps, Steam pressure relief valves.
- d. Electrical systems (including transformers, diesel electric generator sets, automatic transfer switches, primary switchgear, secondary switchgear, high voltage switches, variable frequency drives, and frequency converters).
- e. Fire protection systems and fire alarm detection systems
- f. Cathodic protection
- g. Site civil water utilities (including water, storm water collection, and treatment systems)
- h. Site civil wastewater utilities (including pumping station, tanks, treatment and filters)
- i. Potable water systems (including wells, tanks, pumps, back-flow preventers, filters, disinfection, and controllers)
- j. Site electrical utilities (including substations, transformers, and pad mounted switchgear)

## PART 2 PRODUCTS

### 2.1 DESCRIPTION OF WORK

#### 2.1.1 eOMSI DATA FILES

Provide the following items of data in a format compatible with the CMMS used on the project. Enter all data in the eOMSI Spreadsheet Workbook / Flat File.

##### 2.1.1.1 Equipment Information

- a. Equipment Listing - Provide the following information for each piece of installed equipment and for each applicable item listed on the UEM Asset Classification tab of the eOMSI Spreadsheet Workbook. Enter all information on the Flat File - Equipment Data tab of the eOMSI Spreadsheet Workbook.

- (1) Asset\_ID
- (2) Asset Description
- (3) ORG\_ID
- (4) Site\_ID

- (5) Building Name
- (6) Asset Type
- (7) Inventory Category
- (8) Location Code
- (9) Design Life
- (10) FCI
- (11) Remaining Service Life
- (12) DCR
- (13) Work Center
- (14) Belongs to (Parent Asset. ID)
- (15) Contract number
- (16) Task/delivery order number
- (17) Drawing reference ID
- (18) Location description
- (19) Master system Unifomat
- (20) System Unifomat
- (21) Subsystem Unifomat
- (22) Quantity
- (23) Install date
- (24) Replacement cost
- (25) Manufacturer
- (26) Model number
- (27) Serial number
- (28) Manufacturer Warranty end date
- (29) Warranty Company Info
- (30) Comment (Such as: Required information not to void warranty)
- (31) Status Date
- (32) Asset Status
- (33) UEM Classification ID
- (34) UEM Classification Description

(35) Job Plan Code (Preventive Maintenance)

The Job Plan List is provided by NAVFAC to identify applicable Job Plan Codes. If NAVFAC does not have a Job Plan for the equipment used, provide information in paragraph entitled Job Plan for Equipment NOT assigned a NAVFAC Job Plan below.

(36) Equipment Tag Number

- b. Job Plan for Equipment NOT assigned a NAVFAC Job Plan - Preventive Maintenance Procedures, and Schedules. If the Government cannot provide a job plan for a specific piece of equipment, provide a detailed Job Plan (Preventive Maintenance Plan) using manufacturer's recommendations and sound engineering practice. Show associated frequencies when job plan is to be performed and include detailed preventive maintenance (PM) procedures such as inspections, tests, adjustments required to ensure proper and economical operation and minimize corrective maintenance. For periodic calibrations, provide manufacturer's specified frequency and procedures for each operation. Detailed Job Plans include the following:

- (1) Safety instructions and precautions,
- (2) Including lock out/tag out precautions,
- (3) Required skill level,
- (4) Number of personnel needed,
- (5) Frequency of performing the job plan,
- (6) Special tools needed,
- (7) Parts needed
- (8) Estimated time required to complete the task.
- (9) Lubrication schedules indicating types, grades and capacities.

2.1.1.2 Non-Equipment Information

- a. Provide the following information for each item of non-equipment. Enter all information on the eOMSI Spreadsheet Workbook - Flat File Non-Equipment Data tab.

- (1) Asset ID
- (2) Asset Description
- (3) ORG\_ID
- (4) Site\_ID
- (5) Asset Type
- (6) Inventory Category
- (7) Design Life

- (8) FCI
- (9) DCR
- (10) Building Name
- (11) Location Code
- (12) Contract Number
- (13) Task/ Delivery Order Number
- (14) Drawing Reference \_ID
- (15) Notes on CIMU Structure
- (16) Master System Unifomat
- (17) System Unifomat
- (18) Subsystem Unifomat
- (19) Quantity
- (20) Install Date
- (21) Remaining Service Life
- (22) Replacement Cost
- (23) Warranty End Date
- (24) Warranty Company Info
- (25) Comments (Such as: Required information not to void warranty)

#### 2.1.1.2 eOMSI DOCUMENT FILES

##### 2.1.1.2.1 Facility Information

Facility Information includes the following;

- a. **General** Facility and System Description - Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundation type, expected number of occupants, and facility Category Code. List and generally describe all the facility systems listed in the Primary Systems Information and any special building features (for example, HVAC Controls, Sprinkler Systems, cranes, elevators, and generators). Include photographs marked up and labeled to show key operating components and the overall facility appearance.
- b. **Basis** of Design - Create the Basis of Design that shows the basic design scope of work, assumptions and the original intentions of the DOR. Identify the site utility design goals, objectives, design load limits, assumptions, and system features that are critical to the operation and maintenance of the systems.
- c. **Safety** Hazards - List all residual hazards identified in the Activity

Hazard Analysis as prepared by the DOR. Provide recommended safeguards for each identified hazard.

- d. **Floor** Plans - Provide uncluttered, legible 11 by 17 inches floor plans. Include room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include construction instructions, references, frame numbers, etc.
- e. **Floor** Coverings, Wall Surfaces, Ceiling Surfaces - Provide a table that lists by room number (including hallways and common spaces), the type, and area of finish. The table shall include a facility summary of the total area for each type of space and floor, wall, or ceiling finish.
- f. **Roofing** - Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system; manufacturer's, supplier's, and installer's names, addresses, and phone numbers. For each type of roof, provide a recommended inspection, maintenance and repair schedule that details checkpoints, frequencies, and prohibited practices. List roof structural load limits.
- g. **Supply** Inventory Requirements - Provide a list of maintenance and repair supplies (e.g., spare parts, fuels and lubricants) required to ensure continued operation without unreasonable delays. Identify and list parts and supplies that have long purchase lead times. Give special consideration to facilities at remote locations.

#### 2.1.2.2 Primary Systems

Provide Primary Systems Information for all primary systems listed below. Primary systems information shall address operations, troubleshooting guides and diagnostic techniques, repair, and preventive maintenance.

- a. HVAC facility systems
- b. Direct digital controls/ space temperature controls
- c. Electrical systems
- d. Fire protection systems and fire alarm and detection systems
- e. Cathodic protection
- f. Site civil utilities (including water, wastewater, storm water collection, gas/ fuel, manholes/ hand holes, and pumping, and treatment systems)
- g. Site electrical utilities (including power generation, communications, distribution, ducts, and manholes/ hand holes)

#### 2.1.2.3 Primary Systems Information

Primary Systems Information requires using a systems approach. This approach requires that consideration be given to the entire system (that is, the interfaces of equipment, connections and material flow within the system). Use Notes, Cautions and Warnings throughout the Primary Systems Information to emphasize important and critical instructions and procedures. Provide the following information for each system:

- a. **Operation**

- (1) System Description - Provide a detailed discussion of the system composition and operation. Include technical details that are essential for an understanding of the system.
- (2) Start-Up and Shutdown Procedures - Provide step by step instructions to bring systems from static to operational configurations and from operating to shutdown status.
- (3) Normal and Emergency Operating Instructions - Provide a discussion of the normal and emergency operation and control of the system. Address operating norms (for example, temperatures, pressures, and flow rates) expected at each zone or phase of the system. Supplement the discussion with control and wiring diagrams and data. Include shutdown instruction for fires, explosions, spill, or other contingencies.
- (4) System Flow Diagrams - Provide a flow diagram indicating system liquid, air or gas flow during normal operations. Integrate all system components into the diagram. A compilation of non-integrated, flow diagrams for the individual system components are not acceptable.
- (5) Field Test Reports - Provide Field Test Reports (SD-06) that apply to equipment associated with the system. The eOMSI Document Submittal does not require the second season HVAC testing.
- (6) Operator Servicing Requirements - Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.

**b. Troubleshooting** Guides and Diagnostic Techniques

**Provide** step-by-step procedures for isolating the cause of system malfunctions. The procedures shall clearly state indications or symptoms of trouble; the sequential instructions, including checks and tests to be performed and conditions to be sought, to determine the cause; and remedial measures to bring the equipment and system to operating condition. Identify special test equipment required to perform the procedures. Start the troubleshooting guide at the system level and proceed to a level where detailed manufacturer's troubleshooting procedures for equipment and components can be referenced. Provide clear references to repair procedures included in the manufacturer's Product Data.

**c. Repair**

**Repair** Procedures - Provide repair instructions required for restoring equipment to proper operating condition and standards. References must be specific as to location within the eOMSI manuals.

2.1.2.4 Product and Drawing Information

This portion of the eOMSI provides a record of the facility products, materials, equipment, and minimum information necessary to operate the facility. Provide Product and Drawing Information for all systems in the final constructed facility, including the anticipated critical systems



identified in this specification section.

- a. **O&M Data.** Include, as a minimum O&M Data, required in the SD-10 Data Packages of the UFGS specifications. Provide the following for each product, material, and system on the project:

- (1) Materials
- (2) Equipment
- (3) Data Sheets
- (4) Test Reports
- (5) Warranties
- (6) Certificates
- (7) Shop Drawings

- b. **Drawings.** Provide original CADD drawings or original facility design drawings that have been edited to eliminate unneeded information and highlight eOMSI information in PDF format. Provide the following drawings at a large enough scale to be clear, legible, and able to differentiate designated isolation units from surrounding valves and switches.

- (1) **Utility** Schematic Diagrams - Provide a one line schematic diagram for each utility system such as power, water, wastewater, and gas/fuel. Schematic diagram must show from the point where the utility line is connected to the mainline up to the five-foot connection point to the facility. Indicate location or area designation for route of transmission or distribution lines; locations of duct banks, manholes/ handholes or poles; isolation units such as valves and switches; and utility facilities such as pump stations, lift stations, and substations.

- (2) **Enlarged** Connection and Cutoff Plans - Provide enlarged floor plans that provide information between the five foot utility connection point and where utilities connect to facility distribution. Enlarge floor plans/ elevations of the rooms where the utility enters the building and indicate on these plans locations of the main interior and exterior connection and cutoff points for all utilities. Also enlarge floor plans/ elevations of the rooms where equipment is located. Include enough information to enable someone unfamiliar with the facility to locate the connection and cutoff points. Indicate the room number, panel number, circuit breaker, valve number, etc., of each utility and equipment connection and cutoff point, and what that connection and cutoff point controls.

- c. **Equipment** Tags. Provide equipment tags for all applicable items listed in eOMSI Spreadsheet Workbook/ Asset Identification List tab. Provide tags that are durable, oil and water-resistant and approved by the Contracting Officer. Attach tag with copper wire and spray with a clear silicone waterproof coating. Place tags on the equipment in a visible location that can be read by an inspector in a standing position. Provide tag information to include: Contract Number, Maximo Equipment Identification Numbers, and Equipment Tag Number that

corresponds with the drawing. Only equipment with a value of greater than \$2,500 or sized as noted in eOMSI Spreadsheet Workbook/ Asset Identification List tab, shall be tagged.

**Provide** tags for the items listed below in addition to the items listed in eOMSI Spreadsheet Workbook/ Asset Identification List tab:

- (1) **Control** valves for heating, cooling, gas, fuel, water and wastewater for piping **1 1/2 inches** or greater. Main interior and exterior utility cut off valves (no dollar value restriction).

(2)

- d. **Record** Drawings. Provide an electronic copy of the Record Drawings for the project in PDF format, bookmarking all drawings using the sheet title and sheet number . Provide the Record Drawings on the same electronic media as used for the eOMSI submittal but on separate disks or files to allow simultaneous use of the eOMSI and Record Drawings.

## PART 3 EXECUTION

### 3.1 eOMSI TRAINING

Prior to acceptance of the facility by the Contracting Officer for Beneficial Occupancy/ Placed in Service Date, the eOMSI Preparer must provide a comprehensive project-specific Government personnel training program for the systems and equipment of the facility specified in the technical specifications of this Contract. The trainees must include the Facilities Management Specialist , maintenance staff, and applicable building occupants. Coordinate, schedule, and ensure that training is completed. Instructors shall be well-versed in the particular systems that they are presenting. The eOMSI Preparer shall direct a team of specialist to address all aspects of the eOMSI submittal. The team must include at least a mechanical engineer and an electrical engineer. Provide instruction on site at a location approved by the Contracting Officer.

#### 3.1.1 Training Plan

Submit a written **training plan** to the Contracting Officer for approval at least 60 calendar days prior to the scheduled training. Indicate prior approval of the **training plan** by the Commissioning Authority (CA) on the submittal forwarded to the Contracting Officer. Also, coordinate the training schedule with the Contracting Officer and CA. Include within the plan the following elements:

- a. Equipment included in training.
- b. Intended audience.
- c. Location of training.
- d. Objectives.
- e. Subjects covered including description.
- f. Duration of training on each subject.
- g. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.).

- h. Instructor and instructor qualifications for each subject.

### 3.1.1.2 Training Content

The core of this training shall be based on manufacturer's recommendations and the operation and maintenance information defined in [Section 01 78 23 OPERATIONS AND MAINTENANCE DATA](#). The CA is responsible for overseeing and approving the content and adequacy of the training. The eOMSI Preparer and the CA must interview the Government Facilities Management Specialist and the Contracting Officer to determine the special needs and areas where training will be most valuable. The Contracting Officer and CA must decide how rigorous the training should be for each piece of equipment. The training shall include the following for each Primary System:

- a. [Start-up](#), normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms.
- b. [Relevant](#) health and safety issues.
- c. [Discussion](#) of how the feature or system is environmentally responsive. Advise adjustments and optimizing methods for energy conservation.

In addition to the training requirements above, provide a brief summary of "Facility Information" and a more detailed presentation of, "Primary Systems Information". Spend 95 percent of the instruction time during the presentation on the "Primary Systems Information". Include the following for each Primary system training presentation:

- d. Design intent.
- e. Use of O&M Manuals.
- f. Review of control drawings and schematics.
- g. Interactions with other systems.
- h. Special maintenance and replacement sources.
- i. Tenant interaction issues.

### 3.1.1.3 Training Outline

The eOMSI Preparer shall provide each trainee in the course a written course outline, listing the major and minor topics to be discussed by the instructor on each day of the course. Provide the course outline 14 calendar days prior to the training.

### 3.1.1.4 Training Video Recording

Provide to the Contracting Officer two copies of the training course in DVD video recording format. Capture within the recording, in video and audio, all instructors' training presentations including question and answer periods with the trainees. Confirm proposed software, used to create the training is compatible with the using activity resources to play the training materials. The recording camera(s) shall be attended by a person during the recording sessions to assure proper size of exhibits and projections during the recording are visible and readable when viewed as

training.

### 3.1.5 Unresolved Questions from Trainees

If, at the end of the training course, there are questions from trainees that remain unresolved, the instructor shall send the answers, in writing, to the Contracting Officer for transmittal to the trainees, and the training video shall be modified to include the appropriate clarifications.

### 3.1.6 Validation of Training Completion

Ensure that each attendee at each training session signs a class roster daily to confirm Government participation in the training. At the completion of all training, submit a signed validation letter that includes a sample record of training for reporting what systems were included in the training, who provided the training, when and where the training was performed, and copies of the signed class rosters. Provide two copies of the validation to the Contracting Officer, one copy to the OMSI Preparer for inclusion into the OMSI documentation, and one copy to the Documentation Preparer for the Third Party Certification for sustainability.

### 3.1.7 Quality Control Coordination

Coordinate the eOMSI training with the CA in Section 01 45 00.05 20 DESIGN AND CONSTRUCTION QUALITY CONTROL FOR DESIGN-BUILD.

## 3.2 FIELD VALIDATION

Perform the field validation at the 100 percent - Prefinal submittal stage. Coordinate with the Contracting Officer to establish the field validation date, to ensure the availability of Government representatives. Validation without Government representative, unless waived, is not acceptable.

The purpose of the validation is to discuss final requirements needed to complete the eOMSI submittals and to conduct field verification. Field validation is used to verify the accuracy and completeness of the eOMSI Data and eOMSI Documents. This includes verifying that the systems and equipment in the eOMSI submittal accurately reflect the as-built conditions; verifying that O&M procedures are appropriate for the systems and equipment that they support; verifying that equipment nomenclature and system configurations are accurate; and confirming correct equipment tagging.

The eOMSI Preparer, Superintendent, Quality Control Manager, and the Design Quality Control Manager/ Commissioning Authority (CA) shall attend the field validation, to verify the accuracy of the eOMSI Submittal. The eOMSI Preparer shall perform the validation, document the results of the field validation and correct the final eOMSI submittal to reflect the changes identified.

-- End of Section --

SECTION 01 78 30.00 22

GIS DATA DELIVERABLES

11/14

PART 1 GENERAL

1.1 OBJECTIVE

The primary objective of this section is to provide detailed specifications for collection and delivery of geospatial data commonly referred to as Geographic Information System (GIS) data. Additionally, this section shall provide guidance to ensure that all GIS data delivered is compatible and will add value to the Marine Corps Base (MCB) Camp Lejeune Installation Geospatial Information and Services (IGI&S) GEODatabase.

Failure to comply with the specifications outlined in this document will result in non-acceptance of data deliverables.

1.1.1 Point of Contact for MCB Camp Lejeune

The Points of Contact (POC) for assistance in preparation of GIS deliverables are:

Resident Officer In Charge Of Construction  
Construction Manager (CM)  
1005 Michael Drive  
Camp Lejeune, NC 28547-2521  
(910) 451-2581

Public Works Division  
Project Manager (PM) or GIS  
1005 Michael Road  
Camp Lejeune, NC 28547-2521  
(910) 451-2212

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

GIS Data Deliverables; G

1.3 GOVERNMENT GEOSPATIAL DATA AND SCHEMA

1. The IGI&S repository model schema is based on the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) GEOFidelis Data Model with recurring business driven modifications and or adaptations.
  - a. Data will be created and delivered by developing an ARCGIS Personal GEODatabase using ArcGIS 10.1 or higher if a higher version is being utilized by the Government at the time the deliverable is being developed.
  - b. The Contractor shall verify the ArcGIS and schema version, via the CM or PM, at the commencement of this contract. All GIS DATA DELIVERABLES will be created in accordance with the current version and these specifications.

- c. The Contractor is responsible for requesting the existing GIS Data, Schema and Domain Properties by means of a Data Request Package (DRP). Receipt of request will include Geospatial Database table structure, schema, Domain configuration, Attribute text format, i.e., case size as well as Meta Data information.
  - d. The DRP should be submitted prior to the start of data collection efforts and again on an as needed basis. The Contractor shall ensure that all GIS data has been created and delivered utilizing the most up to date IGI&S GEODatabase schema.
2. The Contractor shall submit a request for a Geospatial DRP to the CM or the PM.
  - a. Request shall be completely filled out and include the all information as instructed on the data request form.
  - b. Request only GIS data and or schema for feature classes that are relevant to the contract and within the boundary of project area.
  - c. Utilize associated Government modified domain structure(s).
  - d. Attach Scope of Work, which is defined by this GIS DATA DELIVERABLES section for each project request.
  - e. Return the DRP to the CM or PM for sponsorship and submittal to the Installation Geospatial Information & Services (IGI&S) Office.
  - f. Incomplete forms may delay receipt of the requested GIS data and Schema.

The following Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) website may offer definitions for Feature data sets; Feature Classes and other applicable information. However, please note that specific Schema or Domain modifications are not available via this resource:

<http://www.sdsfieonline.org/>

#### 1.3.1 Global Positioning System (GPS) and Spatial Reference Properties

GPS data shall be completed in accordance with the GPS Data Collection and Documentation Standards, Version 3 (or higher version if available at the time of this project) as prepared by Geographic Information Coordinating Council (GICC) Statewide Mapping Advisory Committee (SMAC) and adopted by the North Carolina Geographic Information Coordinating Council.

1. Prior to GPS efforts, ALL underground utilities shall be located utilizing a utility locating service in order to verify and obtain accurate feature locations.
2. Only bench marks included in the North Carolina Geodetic Survey Base Station Network shall be used for GPS data collection.
3. Mission planning is essential and Contractor shall utilize the best Position Dilution of Precision (PDOP) values for data accuracy.
4. Utility data, as identified in paragraph "ATTRIBUTE DATA COLLECTION AND

GPS REQUIREMENTS FOR SPECIFIC FEATURES" will be collected utilizing Survey Grade GPS data collection methods.

5. Infrastructure data, as identified in paragraph "ATTRIBUTE DATA COLLECTION AND GPS REQUIREMENTS FOR SPECIFIC FEATURES" shall be collected utilizing Sub-Foot or better GPS data collection methods.
  - a. Spatial accuracy requirements for Survey and Sub-Foot grade data collection are as follows:
    - i. Sub-Foot requirements
      - 1) All points shall be within + 12 inches
      - 2) 95% accuracy rate for all points.
    - ii. Survey Grade requirements
      - 1) All points shall be within + 1 centimeter
      - 2) 98% accuracy rate for all points
6. Every effort shall be made to capture feature locations without using offsets. All Offsets will be noted in the Final Report for each feature.
7. Excessive offsets included in the Final Data, which shall be referenced in the Final Report, shall be reviewed for quality control.
  - a. Resubmittal of data will be required if PDOP planning was not observed per this specification.

The following GEODatabase Coordinate Systems and Spatial Reference Properties should be utilized for Camp Lejeune:

1. Transverse Mercator (UTM) Zone 18N
    - a. GRS 1980 spheroid
    - b. North American Datum 1983 (NAD83) horizontal datum
    - c. North American Vertical Datum 1988 (NAVD88) vertical datum.
  2. Domain precision of 1000 which will result in a database accuracy of 1/1000 m
- 1.3.2 Demolished and Abandoned in Place (AIP) features

The Contractor shall reference all Demolished and or AIP features in the data delivered. Should the current feature data class attributes and or domains not reference AIP or demolished features, the Contractor shall be responsible for appropriately delivering these features by creating an associated "Demolished" or AIP feature class, i.e., CLJN.CL.WastewaterUtilitySegment.

The Contractor shall:

1. Utilize a blank schema for the associated feature class.

2. Rename associated feature class and add DEMO or AIP as a prefix, i.e., DEMO.CLJN.CL.WastewaterUtilitySegment, AIP.CLJN.CL.WastewaterUtilitySegment.
3. All demolished and or AIP features should provide existing spatial and non-spatial data which may be copied from existing data.
4. The Contractor will update attributes appropriately to include the following:
  - a. Contract Number
  - b. Drawing Number
  - c. isDemolished
  - d. dateDemolished or dateAIP
  - e. Status

#### 1.3.3 Creating a New Feature Class

Should a new feature class be required that is not readily available in the current GIS schema provided by the Government; the Contractor shall develop the feature class utilizing the schema consistent with the most current version of SDSFIE and document in the Final Report.

1. The Contractor shall include the following modifications (fields) to the schema structure and shall submit all information to the CM or PM for direction and final approval.
  - a. Contract Number
  - b. Drawing Number

#### 1.3.4 GIS Topology Rules

All data must be created using GIS topology rules for polygons, points and lines, such as, but not limited to the following examples:

1. Polygons, Polylines and points rules; please reference illustrating topology rules in ArcGIS at [www.esri.com](http://www.esri.com).
2. Polygons must not have slivers.
3. All utility or infrastructure system data, which is, but is not limited to, transportation system and electrical, water, steam distribution, and wastewater collection, etc., will be created using GIS spatial connectivity rules which specify that vertex, edge and endpoints be snapped to features within the system.
4. Features will be snapped to the appropriate item.
5. Data will be created to represent the real world, for example, water, sewer and transportations systems, etc. will be drawn and or created in the direction of flow.
6. Utility and transportation systems will be created from source to sink, etc.



7. Abandoned In Place (AIP) utility lines will be located and updated in the current feature data set and identified as AIP in the attribute table.

#### 1.3.5 Creation of Geographic Data Documentation (METADATA)

For each digital file delivered containing geographic information the Contractor shall provide documentation consistent with the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM). Both 'GEOFidelis Mandatory' and 'FGDC Mandatory' fields shall be completed for each geographic data set.

The Geospatial Information & Services (IGI&S) Metadata Authoring Guide is included in the DRP package.

Metadata generation tools included in the ArcGIS suite of software (or equivalent technology) shall be used in the production of the required metadata in XML format. Regardless of the tools used for metadata creation, the Contractor must ensure that the metadata is delivered in XML format and can be easily imported into the IGI&S GEODatabase. A copy of the FGDC metadata standard can be obtained on the internet at <http://www.fgdc.gov> or by contacting:

Federal Geographic Data Committee  
590 National Center  
Reston, Virginia 20192  
Email: [fgdc@fgdc.gov](mailto:fgdc@fgdc.gov)

(NOTE: The metadata should be formatted from the Government perspective, not the Contractor project perspective. Therefore such items as Point of Contact (POC) should be the POC currently associated with the data and NOT the Contractor's Project Manager. The Contractor shall use language and format consistent with existing metadata.)

#### 1.3.6 New Feature Class Requirements

When developing a new feature class, the Contractor shall develop the initial structure consistent with the most current version of SDSFIE.

- a. If further modifications to the database structure are required, the Contractor shall consult with the Government Project Manager for direction and final approval.
- b. All new feature data classes shall be created in compliance with SDSFIE noted on the final report.

#### 1.3.7 GIS Submittals Guidelines

All GIS Submittals will be submitted to the CM or PM and then analyzed by Government GIS personnel prior to final approval. Failure to comply with the specifications outlined in this document will result in non-acceptance of data deliverables.

1. Prior to any database development, the Contractor shall provide the Government with a technical approach document for review and approval. The Technical Approach document will describe in detail the Contractor's technical approach to designing and developing the database.

2. All attributes shall be populated in accordance with the "ATTRIBUTE DATA COLLECTION AND GPS REQUIREMENTS FOR SPECIFIC FEATURES" and shall be obtained via contract specifications, plans and record drawings.
3. The Contractor may be required to conduct research, collect data and make copies of reports and studies as necessary to verify existing and/or record drawing data. Record drawing data and closed contracts can be located in the Technical Records Section in the Public Works Department.
4. Raw GPS data and collection data files shall be included with every phase of delivery.
5. Actual spatial and non-spatial conditions in the field always supersede drawings. It is the Contractor's responsibility to locate and field verify all features to ensure attribute data and location is correctly recorded.
6. The Contractor shall submit a preliminary review of data at 15 to 25 percent contract completion to ensure specifications compliance.
7. The Contractor shall deliver digital geographic maps, GPS collection files and related data. All working text and documents and personal geodatabase shall be included for review in the draft and final delivery of data.
  - a. All maps of **GIS DATA DELIVERABLES** will be ANSI C size and include a project title, contract number, scale, legend, standard symbology, attributes, i.e., building numbers, road names, segment diameters, etc.
8. The Contractor may be required to provide a technical consultant to meet on site.
9. The Contractor shall not deliver blank unused schema or feature class data with no attributes. Deliver only data pertinent to the contract that adds value to the GEODatabase per this section.
10. The Contractor shall deliver GIS Data at the end of each phase for all Phased Projects and Construction projects.
11. The Contractor accepts the responsibility to perform quality assurance for all data and related materials required in the section prior to submitting product to the Government.
12. The data will be analyzed for discrepancies in subject content, correct format in accordance with this statement of work, and compatibility with the existing GIS system as well as all other specifications in this section.

#### 1.3.8 Formats, Versions and Guidelines

All data deliverables will be in the following formats and/or versions.

1. GIS data will be provided in an ArcGIS 10.1 or higher if a higher version is being used by the Government at the time of this project. The Contractor shall verify the ArcGIS version, via the CM or PM at the commencement of this contract.

2. Microsoft Office (MS) Suite data shall be delivered in MS 2010.
3. Microsoft Windows 7 operating system, unless otherwise approved by the Government.
4. All reports and maps will be delivered as a hard copy and in a searchable Adobe Portable Document Format (PDF).
5. All text, spreadsheet, and database files, reports and maps shall be delivered on Compact Disc read - only memory (CD-ROM) or Digital Versatile Disc read - only memory (DVD-ROM).
6. The Contractor shall verify required version(s) of software and schema, via the CM or PM.
7. Map submittals shall accompany each geospatial deliverable.
  - a. Include ANSI C map for each project/area.
  - b. Data should be labeled and attributed per specification.
  - c. All maps should include the date, a legend, scale, contract title and number.

#### 1.3.9 Final Report Requirements with additional Guidelines

The Contractor shall follow the following:

1. Specific procedures and list of equipment, software and versions that were utilized for the GPS data collection and creation of geospatial data.
2. Submit all GPS data files.
3. Provide the date(s) the IGI&S schema and geospatial data was received.
4. Provide steps taken to create the GEODatabase.
5. Provide details on any offsets to include justification as to why offsets were utilized and on which features and or points offsets were used.
6. Describe all modifications to the geodatabase to include the name of all new features classes, i.e., new, demolished or AIP.
7. Provide the source that was utilized for required attributes.
  - a. Include an ANSI C size copy of all design drawings that were referenced in the attribute data. This information should be included in all phases of delivery to include draft and final reviews.
  - b. Provide the overall utility site plan drawing(s) with each submittal.
8. Specify Deliverable "Draft #" or "Final Submittal" when data is submitted to the CM or PM for review.

9. Provide the name and contact information for the GIS Technical Point of Contact who can answer questions regarding the data deliverable.
10. GIS DATA DELIVERABLES must be provided in a format that does not require translation or pre/post processing prior to being loaded into the IGI&S GEODatabase.
11. Provide any miscellaneous information that the Contractor deems significant.
12. Provide the current version of the GIS DATA DELIVERABLES specification utilized for this contract submittal.

#### 1.3.10 Ownership

All digital files, final hardcopy products, GPS raw data, source data acquired for this project, and related materials, including that furnished by the Government, shall become the property of the Government and will not be issued, posted, distributed, or published by the Contractor.

Note: No endorsement of software or hardware is implied.

#### 1.4 ATTRIBUTE DATA COLLECTION AND GPS REQUIREMENTS FOR SPECIFIC FEATURES

##### 1.4.1 CLJN.CL.Common

GPS and collect attribute data as specified for each feature listed with GPS accuracy as described in paragraph "Global Positioning System (GPS) and Spatial Reference Properties."

GPS and collect the following attributes:

**CLJN.CL.RoadCenterline** (The center of the road area)

- a) roadCategory
- b) numberOfLanes
- c) speedLimit
- d) isPaved Y/N
- e) isOneWay Y/N
- f) baseRoadName
- g) dateConstructed
- h) gisFeatureCollectionMethod
- i) contractNumber
- j) designDrawingNumber

##### 1.4.2 CLJN.CL.REAL.PROPERTY

GPS and collect attribute data as specified for each feature listed with GPS accuracy as described in paragraph "Global Positioning System (GPS) and Spatial Reference Properties."

GPS and collect the following attributes:

**CLJN.CL.AccessControl** (A structure (manned or unmanned) intended to control access to an area)

- a) assessControlIDPK - Structure ID until Field is created in schema
- b) controlType

- c) contractNumber
- d) designDrawingNumber
- e) Installation date
- f) gisFeatureCollectionMethod
- g) isRangeAccess Y / N
- h) sdsFeatureName (Subtype of access control point / gate)
- i) sdsFeatureDescription

**CLJN.CL.AlternativeEnergyPoint** (Locations used for the production of alternative energy sources, such as wind turbines, photovoltaic, etc)

- a) alternativeEnergyIDPK - Structure ID until Field is created in schema
- b) InstallDate
- c) alternativeEnergyType
- d) contractNumber
- e) designDrawingNumber
- f) gisFeatureCollectionMethod
- g) isPortable
- h) wattage
- i) operationalStatus
- j) panelType
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.AlternativeEnergyArea** (Locations used for the production of alternative energy sources)

- a) operationalStatus
- b) isPortable
- c) panelType
- d) wattage (total)
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) sdsFeatureName - Structure ID until Field is created in schema
- i) Installationdate
- j) sdsFeatureDescription

**CLJN.CL.BoatRamp** (A partially submerged hard surfaced structure on a shoreline for launching or retrieving vessels or vehicles)

- a) boatRampIDPK - Structure ID until Field is created in schema
- b) numberOfLaunchLanes
- c) dateConstructed
- d) gisFeatureCollectionMethod
- e) contractNumber
- f) designDrawingNumber
- g) sdsFeatureName
- h) sdsFeatureDescription

**CLJN.CL.Bridge** (A structure used by vehicles that allows passage over or under an obstacle such as a river, chasm, mountain, road or railroad)

- a) bridgeIDPK - Structure ID until Field is created in schema
- b) bridgeType
- c) isFixed
- d) structureMaterial
- e) dateConstructed
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) sdsFeatureName
- j) sdsFeatureDescription

**CLJN.CL.Building** (A roofed, floored and walled structure that is completely enclosed)

- a) isDemolished
- b) structureNumber
- c) buildingType
- d) buildingUse
- e) heightMax
- f) heightUOM
- g) dateConstructed
- h) dateDemolished
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) sdsFeatureName
- m) sdsFeatureDescription

**CLJN.CL.BuildingFloorPlan** (A linear representation of floor plans for buildings)

- a) buildingFloorLevel
- b) buildingIDFK - Structure ID until Field is created in schema
- c) gisFeatureCollectionMethod
- d) contractNumber
- e) designDrawingNumber
- f) sdsFeatureName
- g) sdsFeatureDescription (Renovation Date)

**CLJN.CL.DocksAndWharfs** (A manmade water-land interface structure often for access to boats or ships)

- a) typeOfDock
- b) docksAndWharfsIDPK - Structure ID until Field is created in schema
- c) accessType
- d) dateConstructed
- e) PurposeType
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) sdsFeatureName
- j) sdsFeatureDescription

**CLJN.CL.Fence** (A freestanding structure designed to restrict or

prevent movement across a boundary)

- a) fenceIDPK - Structure ID until Field is created in schema
- b) fenceMaterial
- c) fenceUse
- d) dateConstructed
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) sdsFeatureName
- i) sdsFeatureDescription

**CLJN.CL.Marina** (Any facility or area for the exchange of people or materials from land to water such as a port, harbor, marina, launch area or small craft facility)

- a) marinaIDPK - Structure ID until Field is created in schema
- b) marinaType
- c) gisFeatureCollectionMethod
- d) contractNumber
- e) designDrawingNumber
- f) sdsFeatureName
- g) createdDate (Construction Date)
- h) sdsFeatureDescription

**CLJN.CL.NavigationalAid** (A visual or electronic device, on the ground or airborne, which provides point-to-point guidance information or position data to aircraft in flight)

- a) navigationalAidIDPK - Structure ID until Field is created in schema
- b) navaidType
- c) operatingSpectrum
- d) gisFeatureCollectionMethod
- e) contractNumber
- f) designDrawingNumber
- g) sdsFeatureName
- h) sdsFeatureDescription

**CLJN.CL.PavementSection** (A pavement section is a portion of a pavement branch that differs in some aspect from other sections such that further segmentation is required to uniquely identify that section)

- a) pavementSectionIDPK - Structure ID until Field is created in schema
- b) pavementSectionType
- c) isLighted
- d) isSurfaced
- e) operationalStatus
- f) pavementSurfaceType
- g) hasLinesPainted
- h) dateConstructed
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) sdsFeatureName

m) sdsFeatureDescription

**CLJN.CL.RailTrack** (A track is the main designation for describing a physical linear portion of the network)

- a) railTrackIDPK - Structure ID until Field is created in schema
- b) railConstructionType
- c) operationalStatus
- d) dateConstructed
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) sdsFeatureName
- i) sdsMetadataID
- j) sdsFeatureDescription

**CLJN.CL.RecreationArea** (An area defined for recreational purposes)

- a) recreationAreaIDPK - Structure ID until Field is created in schema
- b) areaType
- c) permittedHunting
- d) recreationalFeatureType
- e) dateConstructed
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) sdsFeatureName
- j) sdsFeatureDescription

**CLJN.CL.RecreationTrail** (A location providing physical activities which are mentally relaxing, such as running/walking, biking, or hiking)

- a) recreationTrailIDPK - Structure ID until Field is created in schema
- b) trailType
- c) isPaved
- d) dateConstructed
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) sdsFeatureName
- i) sdsFeatureDescription

**CLJN.CL.StructureArea** (A facility classified as other than a building or linear asset)

- a) structureType
- b) structureUse
- c) structureNumber (structure Number)
- d) structureMaterial
- e) isDemolished
- f) dateConstructed
- g) dateDemolished
- h) gisFeatureCollectionMethod



- i) contractNumber
- j) designDrawingNumber
- k) sdsFeatureName
- l) sdsMetadataID
- m) sdsFeatureDescription

**CLJN.CL.StructurePoint** (Example: Flag poles; Point of Information Signs (POI) etc)

- a) structureType
- b) structureUse
- c) structureNumber (Structure Number)
- d) structureMaterial
- e) isDemolished
- f) dateConstructed
- g) dateDemolished
- h) gisFeatureCollectionMethod
- i) contractNumber
- j) designDrawingNumber
- k) sdsFeatureDescription

**CLJN.CL.Tower** (A vertical projection, higher than its diameter, generally used for observation, storage, or electronic transmission)

- a) towerUseType
- b) heightMax
- c) heightUOM
- d) facilityName
- e) towerType
- f) structureUse
- g) structureNumber
- h) structureMaterial
- i) isDemolished
- j) dateConstructed
- k) dateDemolished
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) sdsFeatureDescription - street intersection

**CLJN.CL.TrafficControlLight** (A feature used to represent traffic lights)

- a) trafficControlLightIDPK
- b) realPropertyUniqueIdentifier
- c) gisFeatureCollectionMethod
- d) contractNumber
- e) designDrawingNumber
- f) sdsFeatureName
- g) sdsMetadataID
- h) sdsID
- i) createdDate
- j) createdBy
- k) sdsFeatureDescription

**CLJN.CL.Wall** (A linear feature used for separation of facilities, ornamental decoration, or structural reinforcement (retaining wall))

- a) wallIDPK - Structure ID until Field is created in schema
- b) wallType
- c) wallHeight
- d) wallHeightUOM
- e) dateConstructed
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) sdsFeatureName
- j) sdsFeatureDescription

#### 1.4.3 CLJN.CL.REAL\_PROPERTY\_RESTRICTED

GPS and collect attribute data as specified for each feature listed with GPS accuracy as described in paragraph "Global Positioning System (GPS) and Spatial Reference Properties."

GPS and collect the following attributes:

**CLJN.CL.Well** (A shaft dug or drilled into the Earth for the purpose of extracting fluids from the subsurface, collecting environmental samples, injecting fluids into the subsurface or extracting contamination or other impurities from the subsurface)

- a. wellPointIDPK - Structure ID until Field is created in schema
- b. wellPurpose
- c. wellResource
- d. operationalStatus
- e. isPotable
- f. isWellActive
- g. dateConstructed
- h. gisFeatureCollectionMethod
- i. contractNumber
- j. designDrawingNumber
- k. sdsFeatureName
- l. sdsFeatureDescription

#### 1.4.4 CLJN.CL.UTILITIES

GPS and collect attribute data as specified for each feature listed with GPS accuracy as described in paragraph "Global Positioning System (GPS) and Spatial Reference Properties."

GPS and collect the following attributes:

**CLJN.CL.ElecUtilNode\_eExteriorLight** (Exterior lighting is supplied by local distribution systems and is generally the only service for which the electric utility installs, operates and maintains utilization equipment)

- a) exteriorLightType
- b) electricalNodeType
- c) operationalStatus
- d) isLED
- e) cableCircuitName

- f) hasSensor
- g) lightingFixtureHeight
- h) heightUOM
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) equipmentInstallationDate
- m) sdsFeatureName
- n) sdsFeatureDescription

**CLJN.CL.EnviDiscPoin\_Stormwater** (A specific location of an intentional discharge of stormwater into the environment)

- a) isPermitted
- b) stormwaterBasinIDFK Structure ID
- c) gisFeatureCollectionMethod
- d) contractNumber
- e) designDrawingNumber
- f) equipmentInstallationDate
- g) sdsFeatureName
- h) sdsFeatureDescription

**CLJN.CL.GeothermalWell** (A geothermal well is part of a central heating and/or cooling system that pumps heat to or from the ground)

- a) geothermalWellIDPK
- b) pipeMaterial
- c) geothermalWellCasingMaterial
- d) thermalInsulationMaterial
- e) geothermalWellDepth
- f) geothermalWellDepthUOM
- g) downholePipeDiameter
- h) downholePipeDiameterUOM
- i) hasBentoniteSeal
- j) hasPump
- k) operationalStatus
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) equipmentInstallationDate
- p) sdsFeatureDescription - Associated Building Number

**CLJN.CL.Impoundment\_Stormwater** (An accumulation of stormwater that is impounded by a dam or wier)

- a) permitID
- b) impoundmentType
- c) waterSurfaceElevation
- d) waterSurfaceElevationUOM
- e) impoundmentIDPK - Structure ID until Field is created in schema
- f) dateConstructed
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) sdsFeatureName

- k) sdsFeatureDescription

**CLJN.CL.StormwaterUtilityNode\_swInlet** (The location at which stormwater is collected/received into the stormwater network)

- a) stormwaterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) stormwaterNodeType
- c) stormwaterInletType
- d) numberOfPipes
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) equipmentInstallationDate
- i) sdsFeatureName
- j) sdsFeatureDescription

**CLJN.CL.StormwaterUtilitySegment** (A subdivision of a stormwater network, particularly a pipeline or drainage ditch for the transport of stormwater, between the source, holding facilities, and/or treatment facilities)

- a) diameter
- b) diameterUOM
- c) pipeMaterial
- d) isLined
- e) downstreamInvertElevation
- f) upstreamInvertElevation
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.StorUtilNode\_swManhole** (A stormwater manhole is an underground concrete structure with a top opening used for collecting and routing stormwater runoff through underground pipes)

- a) stormwaterNodeType
- b) stormwaterUtilityNodeIDPK - Structure Number unless another field becomes available
- c) numberOfPipes
- d) operationalStatus
- e) stormwaterBasinIDFK
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.ThermalUtilityNode\_tFitting** (The Thermal Fitting subclass represents the joint between two lines)

- a) thermalNodeType
- b) diameter
- c) diameterUOM
- d) operationalStatus
- e) thermalFittingType
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.ThermalUtilitySegment** (A subdivision of a thermal distribution network, particularly a pipeline for the transmission of chilled water, refrigerant, hot water, or steam)

- a) thermalSegmentType
- b) networkSubType
- c) thermalPipeMaterial
- d) pipeLocation
- e) diameter
- f) diameterUOM
- g) thermalInsulationMaterial
- h) isClosedLoopSystem
- i) isMarkedForLocating
- j) gisFeatureCollectionMethod
- k) contractNumber
- l) designDrawingNumber
- m) equipmentInstallationDate
- n) sdsFeatureName
- o) sdsFeatureDescription

**CLJN.CL.TherUtilNode\_tProdStruc** (Thermal production structures are facilities which produce steam, high-temperature water, low-temperature water, dual-temperature water or chilled water)

- a) thermalUtilityNodeIDPK - Structure ID until Field is created in schema
- b) thermalNodeType
- c) designCapacity
- d) designCapacityUOM
- e) operationalStatus
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.TherUtilNode\_tSystemValve** (A thermal system valve is a device installed in a pipeline to isolate flow)

- a) thermalNodeType
- b) diameter
- c) diameterUOM
- d) operationalStatus

- e) thermalValveType
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.UtilFeat\_eSupportStructure** (A structure that supports electric devices. Examples include poles, towers, Hframes, and push brace poles.)

- a) utilityFeatureType
- b) networkType
- c) heightValue
- d) heightUOM
- e) utilityOwner
- f) operationalStatus
- g) cableCircuitName - List is available from CM or PM
- h) gisFeatureCollectionMethod
- i) contractNumber
- j) designDrawingNumber
- k) equipmentInstallationDate
- l) sdsFeatureName
- m) sdsFeatureDescription

**CLJN.CL.UtilFeat\_sPretreatmentDevice** (A wastewater pretreatment device is a piece of equipment that removes contaminants before they enter the waste stream, i.e., OWS & Trap, etc.)

- a) utilityFeatureIDPK - Structure ID until Field is created in schema
- b) utilityFeatureType
- c) operationalStatus
- d) pretreatmentDeviceType
- e) designCapacity
- f) designCapacityUOM
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.UtilFeat\_tUGEnclosureAccess** (A point feature class for locating the access point to a thermal manhole junction)

- a) utilityFeatureType - Structure ID until Field is created in schema
- b) networkType
- c) networkSubType
- d) operationalStatus
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) equipmentInstallationDate

- i) sdsFeatureName
- j) sdsFeatureDescription

**CLJN.CL.UtilityFeature\_sPumpStation** (This is a collection of waste water Pump Station is a facility - this is used to show total capacity for the station)

- a) utilityFeatureIDPK - Structure ID until Field is created in schema
- b) utilityFeatureType
- c) networkType
- d) numberOfPumps
- e) totalDesignCapacity
- f) designCapacityUOM
- g) totalRatedFlow
- h) ratedFlowUOM
- i) operationalStatus
- j) gisFeatureCollectionMethod
- k) contractNumber
- l) designDrawingNumber
- m) equipmentInstallationDate
- n) sdsFeatureName
- o) sdsFeatureDescription

**CLJN.CL.UtilityFeature\_sSCADASensor** (The SCADA sensor is a feature that is used to remotely measure the status of network components)

- a) utilityFeatureIDPK - Structure ID until Field is created in schema
- b) utilityFeatureType
- c) networkType
- d) networkSubType
- e) operationalStatus
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.UtilityFeature\_sSepticTank** (A wastewater septic tank is a small-scale anaerobic digester and leach field designed to treat wastewater from an individual facility, and is not connected to the wastewater collection system)

- a) utilityFeatureType
- b) networkType
- c) storageTankProduct
- d) tankLocation
- e) volume
- f) volumeUOM
- g) isContained
- h) utilityFeatureIDPK - Structure ID until Field is created in schema
- i) isRegulated
- j) numberLaterals

- k) operationalStatus
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) equipmentInstallationDate
- p) sdsFeatureName
- q) sdsFeatureDescription

**CLJN.CL.UtilityFeature\_sUtilityArea** (The sUtilityArea is an area of land surrounding a wastewater utility asset or an area of land specifically designated for wastewater utility use, i.e., septic fields, storm water basin, Oil water separator, etc)

- a) utilityFeatureIDPK - Structure ID until Field is created in schema
- b) utilityFeatureType
- c) wastewaterUtilityAreaType
- d) networkType
- e) networkSubType
- f) designCapacity
- g) designCapacityUOM
- h) operationalStatus
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) equipmentInstallationDate
- m) sdsFeatureName
- n) sdsFeatureDescription

**CLJN.CL.WastewaterUtilityNode\_sFitting** (The wastewater fitting class represents the joint between two lines)

- a) wastewaterNodeType
- b) networkSubType
- c) diameter
- d) diameterUOM
- e) operationalStatus
- f) pipeMaterial
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.WastewaterUtilityNode\_sManhole** (The wastewater fitting class represents the joint between two lines)

- a) wastewaterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) wastewaterNodeType
- c) operationalStatus
- d) numberOfPipes
- e) pipeMaterial
- f) diameter
- g) diameterUOM



- h) rimElevation
- i) elevationUOM
- j) gisFeatureCollectionMethod
- k) contractNumber
- l) designDrawingNumber
- m) equipmentInstallationDate
- n) sdsFeatureName
- o) sdsFeatureDescription

**CLJN.CL.WastewaterUtilityNode\_sPump** (A wastewater pump is a piece of equipment that adds energy to a fluid being conveyed through a pipe or other closed conduit)

- a) wastewaterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) networkSubType
- c) ratedFlow
- d) ratedFlowUOM
- e) operationalStatus
- f) pumpHorsepower
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) gisFeatureCollectionMethod
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.WastewaterUtilitySegment** (Wastewater Line - A pipeline for the transport of sewage or industrial waste between the source, holding facilities, and/or treatment facilities)

- a) wastewaterSegmentType
- b) networkSubType
- c) pipeLocation
- d) utilityOwner (CLJN / ONWASA)
- e) operationalStatus
- f) pipeMaterial
- g) isLined
- h) isMarkedForLocating
- i) diameter
- j) diameterUOM
- k) gisFeatureCollectionMethod
- l) contractNumber
- m) designDrawingNumber
- n) equipmentInstallationDate
- o) sdsFeatureName
- p) downstreamInvertElevation
- q) upstreamInvertElevation
- r) elevationUOM
- s) slope
- t) slopeUOM
- u) sdsFeatureDescription

**CLJN.CL.WastUtilNode\_sCleanOut** (A wastewater A clean out is an access point in a lateral used for maintenance purposes)

- a) wastewaterNodeType
- b) pipeMaterial
- c) diameter
- d) diameterUOM
- e) operationalStatus
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.WastUtilNode\_sSystemValve** (A system valve is a facility that is fitted to a pipeline or orifice in which the closure member is either rotated or moved transversely or longitudinally in the waterway so as to control or stop the flow)

- a) wastewaterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) wastewaterNodeType
- c) networkSubType
- d) wastewaterValveMaterial
- e) diameter
- f) diameterUOM
- g) operationalStatus
- h) wastewaterValveType
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) equipmentInstallationDate
- m) sdsFeatureName
- n) sdsFeatureDescription

**CLJN.CL.WastUtilNode\_sTreatmentPlant** (A facility designed to treat wastewater using physical, chemical and/or biological processes prior to discharge into receiving waters)

- a) wastewaterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) wastewaterNodeType
- c) designCapacity
- d) designCapacityUOM
- e) operationalStatus
- f) buildingIDFK
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

#### 1.4.5 CLJN.CL.UTILITIES\_RESTRICTED

GPS and collect attribute data as specified for each feature listed with GPS accuracy as described in paragraph "Global Positioning System (GPS) and Spatial Reference Properties."

GPS and collect the following attributes:

**CLJN.CL.ElectricalUtilityNode\_eSwitch** (Electrical Switches are installed at strategic locations throughout distribution feeder circuits)

- a) normalPosition
- b) operationalStatus
- c) electricalSwitchType
- d) electricalSwitchInstallation
- e) cableCircuitName
- f) numberOfPhases
- g) numberOfSwitches
- h) voltage
- i) utilityOwner
- j) gisFeatureCollectionMethod
- k) contractNumber
- l) designDrawingNumber
- m) equipmentInstallationDate
- n) sdsFeatureName
- o) sdsFeatureDescription

**CLJN.CL.ElectricalUtilitySegment** (A subdivision of an electrical distribution network, particularly a line for the transmission of electricity)

- a) electricalSegmentType
- b) electricCableMaterial
- c) pipeLocation
- d) voltage
- e) utilityOwner
- f) operationalStatus
- g) electricalCableClass
- h) electricCableMaterialSubtype
- i) insulationMaterial
- j) conductSize
- k) neutralSize
- l) numberOfConduct
- m) numberOfNeutral
- n) numberOfPhases
- o) cableCircuitName - List is available from CM or PM
- p) gisFeatureCollectionMethod
- q) contractNumber
- r) designDrawingNumber
- s) equipmentInstallationDate
- t) sdsFeatureName
- u) sdsFeatureDescription

**CLJN.CL.ElecUtilNode\_eGenerator** (Generator is a power source for providing electricity. Generators may be primary or standby power sources)

- a) electricalNodeType
- b) operationalStatus
- c) modelNumber
- d) serialNumber
- e) isPortable

- f) fuelCapacity
- g) fuelCapacityUOM
- h) voltage
- i) generatorKVARating
- j) cableCircuitName - List is available from CM or PM
- k) osdSiteIDFK
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) equipmentInstallationDate
- p) sdsFeatureName (Manufacture)
- q) sdsFeatureDescription(Structure Number)

**CLJN.CL.ElecUtilNode\_eMeterPoint** (A water meter point represents the location of the metering device.)

- a) electricalUtilityNodeIDPK - Structure Number unless another field becomes available
- b) electricalNodeType
- c) operationalStatus
- d) utilityOwner
- e) cableCircuitName - List is available from CM or PM
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsMetadataID
- l) sdsID
- m) sdsFeatureDescription

**CLJN.CL.ElecUtilNode\_eTransformer** (The Transformer feature class captures information about distribution and power transformers)

- a) electricalUtilityNodeIDPK - Structure ID until Field is created in schema
- b) electricalNodeType
- c) transformerType
- d) operationalStatus
- e) modelNumber
- f) serialNumber
- g) numberOfTransformers
- h) primaryVoltage
- i) secondaryVoltage
- j) totalTransformerKVARating
- k) transformerKVADescription
- l) transformerCapacityDescription
- m) cableCircuitName - List is available from CM or PM
- n) electricalFacilitySiteIDFK - Source
- o) gisFeatureCollectionMethod
- p) contractNumber
- q) designDrawingNumber
- r) equipmentInstallationDate
- s) sdsFeatureName (Manufacture)
- t) sdsFeatureDescription

**CLJN.CL.ElecUtilNode\_eVoltageRegulator** (Voltage regulators vary the ac supply or source voltage to the customer to maintain the voltage within desired limits)

- a) electricalUtilityNodeIDPK - Structure ID until Field is created in schema
- b) electricalNodeType
- c) operationalStatus
- d) facilityIDFK
- e) primaryVoltage
- f) secondaryVoltage
- g) numberOfPhases
- h) cableCircuitName - This available from CM or PM
- i) electricalFacilitySiteIDFK - Structure ID until Field is created in schema
- j) gisFeatureCollectionMethod
- k) contractNumber
- l) designDrawingNumber
- m) equipmentInstallationDate
- n) sdsFeatureName
- o) sdsFeatureDescription

**CLJN.CL.POLUtilityNode\_oDispenser** (A fuel dispenser is a machine at a fueling station that is used to pump fuel into vehicles or AGE equipment)

- a) pOLUtilityNodeIDPK
- b) polNodeType
- c) networkSubType
- d) operationalStatus
- e) gisFeatureCollectionMethod
- f) contractNumber
- g) designDrawingNumber
- h) equipmentInstallationDate
- i) sdsFeatureName
- j) sdsFeatureDescription (Structure Number)

**CLJN.CL.UtilFeat\_eElecFacilitySite** (Polygon feature class to define boundaries of electrical facility stations)

- a) utilityFeatureType
- b) networkType
- c) networkSubType
- d) operationalStatus
- e) cipIDFK
- f) numberOfCircuits
- g) numberOfSpareBays
- h) numberOfTransformers
- i) voltageIn
- j) cableCircuitName
- k) utilityOwner
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) equipmentInstallationDate
- p) sdsFeatureName
- q) sdsFeatureDescription (Structure Number)

**CLJN.CL.UtilFeat\_eUndergroundStructure** (UndergroundStructure is a simple junction feature that includes vaults and manholes that house and protect electrical equipment)

- a) utilityFeatureIDPK (Structure Number)
- b) utilityFeatureType
- c) networkType
- d) networkSubType
- e) operationalStatus
- f) electricalJunctionType (manhole, Junction Box, Handhole, etc)
- g) diameter
- h) diameterUOM
- i) numberOfCables
- j) rimElevation
- k) rimElevationUOM
- l) cableCircuitName List is available from CM or PM
- m) gisFeatureCollectionMethod
- n) contractNumber
- o) designDrawingNumber
- p) equipmentInstallationDate
- q) sdsFeatureName
- r) sdsFeatureDescription

**CLJN.CL.UtilFeat\_oPumpingFacility** (A structure, typically a building, containing pumps, filters, and controls as part of a larger fuel handling system)

- a) utilityFeatureIDPK - Structure ID until Field is created in schema
- b) utilityFeatureType
- c) networkType
- d) networkSubType
- e) operationalStatus
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.UtilFeat\_wUGEnclosureAccess** (A point feature class for locating the access point to a water manhole junction)

- a) utilityFeatureIDPK - Structure Number unless another fields becomes available
- b) networkType
- c) numberOfPipes
- d) groundElevation
- e) elevationUOM
- f) operationalStatus
- g) waterServiceAreaIDFK
- h) gisFeatureCollectionMethod
- i) contractNumber
- j) designDrawingNumber

- k) equipmentInstallationDate
- l) sdsFeatureName
- m) utilityFeatureType
- n) sdsFeatureDescription

**CLJN.CL.WaterUtilityNode\_wFitting** (The water fitting class represents the joint between two lines in the water network)

- a) waterNodeType
- b) diameter
- c) diameterUOM
- d) operationalStatus
- e) waterFittingType
- f) waterServiceAreaIDFK
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.WaterUtilityNode\_wHydrant** (A water distribution point that enables fire fighters to attach fire hoses)

- a) waterNodeType
- b) networkSubType
- c) operationalStatus
- d) waterHydrantConnectionType
- e) waterServiceAreaIDFK
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.WaterUtilityNode\_wMeterPoint** (A water meter point represents the location of the metering device)

- a) waterNodeType
- b) networkSubType
- c) operationalStatus
- d) WaterUtilityNode\_wMeterPoint - Structure ID until Field is created in schema
- e) waterServiceAreaIDFK
- f) gisFeatureCollectionMethod
- g) contractNumber
- h) designDrawingNumber
- i) equipmentInstallationDate
- j) sdsFeatureName
- k) sdsFeatureDescription

**CLJN.CL.WaterUtilityNode\_wSystemValve** (A valve used to regulate pressure, isolate, throttle flow, prevent backflow, and relieve pressure)

- a) diameter
- b) diameterUOM
- c) operationalStatus
- d) waterValveType
- e) valveElevation
- f) groundElevation
- g) elevationUOM
- h) waterServiceAreaIDFK
- i) gisFeatureCollectionMethod
- j) contractNumber
- k) designDrawingNumber
- l) equipmentInstallationDate
- m) sdsFeatureName
- n) sdsFeatureDescription

**CLJN.CL.WaterUtilitySegment** (A subdivision of a water distribution network, particularly a distribution pipeline)

- a) waterSegmentType
- b) networkSubType
- c) pipeLocation
- d) waterPipeMaterial
- e) diameter
- f) diameterUOM
- g) utilityOwner
- h) operationalStatus
- i) waterType
- j) waterSegmentUse
- k) waterServiceAreaIDFK
- l) gisFeatureCollectionMethod
- m) contractNumber
- n) designDrawingNumber
- o) equipmentInstallationDate
- p) sdsFeatureName
- q) isMarkedForLocating
- r) sdsFeatureDescription

**CLJN.CL.WateUtilNode\_wProdStructure** (Water production structures are facilities which produce raw or treated water)

- a) waterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) waterNodeType
- c) networkSubType
- d) designCapacity
- e) designCapacityUOM
- f) operationalStatus
- g) gisFeatureCollectionMethod
- h) contractNumber
- i) designDrawingNumber
- j) equipmentInstallationDate
- k) sdsFeatureName
- l) sdsFeatureDescription

**CLJN.CL.WateUtilNode\_wStorageStructure** (Water storage structures are



facilities that store large volumes of water - Water Tank)

- a) waterUtilityNodeIDPK - Structure ID until Field is created in schema
- b) waterNodeType
- c) storageTankProduct
- d) volume
- e) volumeUOM
- f) isContained
- g) isRegulated
- h) operationalStatus
- i) diameter
- j) diameterUOM
- k) groundElevation
- l) invertElevation
- m) overflowElevation
- n) topElevation
- o) elevationUOM
- p) tankHeight
- q) waterServiceAreaIDFK
- r) gisFeatureCollectionMethod
- s) contractNumber
- t) designDrawingNumber
- u) equipmentInstallationDate
- v) sdsFeatureName
- w) sdsFeatureDescription

#### 1.4.6 Non-Compliance

Failure to follow the specification outlined in this document will result in non-acceptance of data deliverable.

Note: Geospatial data delivery does not replace record drawing requirements.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

-- End of Section --

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